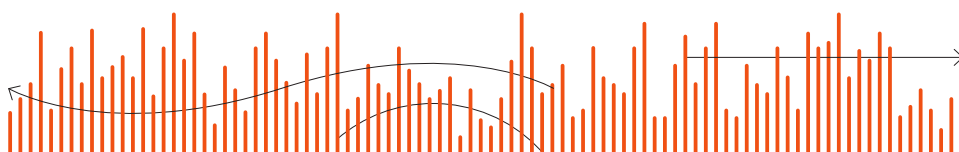


DESIGN PRINCIPLES *for* MOBILE SOUNDWALK APPLICATIONS



Master Thesis 2016
Media Lab (Helsinki),
Department of Media,
School of Arts, Design & Architecture,
Aalto University

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**DESIGN
PRINCIPLES
for
MOBILE
SOUNDWALK
APPLICATIONS**

Pouyan Mohseninia

*Thesis submitted in partial fulfilment of the
Requirement for the degree of Master of Arts in
New Media Design & Production in New Media*

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ABSTRACT

In this contemporary world of advanced technologies and rapid development, where we are overloaded with information, we tend to spend too much time dealing with our digital devices to listen, read or watch different sets of content. We tend to be consumers and/or observers rather than contributors and/or creators of content which as a result we spend less time experiencing the environment which we walk through daily.

This thesis investigates to find design solution to improve the engaging interaction experience of users with mobile soundwalk applications. The idea behind this is to add a layer of awareness to the society, and also to enable people to practice listening more often and a bit closer rather than just walking through a space and focusing on their digital devices. Also, to take advantage of smartphones as a tool to help people record their soundwalk experiences to enable more people to create rather than just consume content. This thesis is based on a research process with the main focus on executing a set of design principles within a participatory design approach, and qualitative research.

According to the analysis and findings from (1) Metrobeat (personal project) (2) Interviews with David (Foundsounds), Joshua (Echoes), and Asmund (Podwalk and Recho) (3) Task scenario exercise survey results (4) Paper-prototype user test results, (5) Creative workshop outcomes, (6) Analysis of my 2 week user test, and (7) Creative workshop user test results, it was concluded that the existing applications do not provide an engaging user experience. In addition, key findings were used to outline the design principles for improving the design for mobile soundwalk applications.

I believe this thesis helps designers deliver a more delightful user experience. In order to do that, I realised that designing elements for user interaction with digital products is needed. Thus, this thesis has delivered these key elements to help create a great mobile user experience. Nevertheless, I believe mobile user experience is still an ongoing field where improvements are to foster and emerge.

Keywords locative media, mobile application, soundscape, soundwalk, interaction design, user experience design, participatory design, new media, research-based design

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*“So many of our dreams at first seem impossible,
then they seem improbable, and then,
when we summon the will, they soon become inevitable”
~ Christopher Reeve, Actor*

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1. INTRODUCTION

Hofstede et al. (2010) *points out that in the first half of the twentieth century, social anthropology developed the conviction that all societies, modern or traditional, face the same basic problem and that only the answer differs.*

In this contemporary world of advanced technologies and rapid development, where we are overloaded with information, have we thought about the amount of time we spend everyday using different digital devices and services? For example, when a person takes the public transport from point A to point B, how does he or she spend this time?

Based on a personal observation during the past three years within Helsinki, Finland, I have noticed that we commonly use our digital devices to listen, read or watch different sets of content. We tend to be consumers and/or observers rather than contributors and/or creators of content. This important is also known as the 90-9-1 rule presented by Nielsen (2006). He argues that the majority of users, are just readers and/or observers and do not contribute. He continues, 9% priorities their time on other matter and spend less time to contribute, whereas, only 1% of users take part in the contribution. Nielsen, describes this situation “inequality in online communities and social media”. My observations portrayed the same issue discussed in Nielsen’s article and as a result I decided to address the problem and put an effort to improve the situation. One significant discipline which I found interesting to do research on and write my thesis was Soundwalk, a walk with a focus on listening to the environment.

My assumption is that soundwalk can help communities improve their understanding of the environment they experience. Not only this practice adds a layer of awareness to the society, but it also enables people to practice listening more often and a bit closer rather than just walking through a space and focusing into their digital devices.

Additionally, we can take advantage from today's advanced technologies such as smartphones which are broadly and commonly used. They can act as a tool to help people record their soundwalk experiences. For example, they can get notifications from significant historical locations or listen to other people's experiences and explore and find new places worth visiting and sharing. In order to answer the raised assumption I will discuss how mobile

soundwalk experiences can be one way to enrich this practice for the public use and also what are the requirements for a positive and enjoyable experience. Furthermore, I will discuss how this important will raise awareness toward inequality in online communities and social media.

1.1. PERSONAL MOTIVATION

I have had the good fortune of living in 5 different countries: Iran where I am originally from, Bulgaria, USA, UAE, Malaysia and now Helsinki, Finland. This has brought to my attention the difficulties I have encountered in my communications. They could have been very basic issues such as introducing myself and/or exchanging greetings to more complex issues such as arguments and debates. I should mention that not only have I personally experienced them, but have been observing others experience them as well. This lead me to become more concerned and curious about cultures, public places, people and stories.

As a result, during my bachelor's thesis, after researching the impact of media, I made a video installation to portray the unheard voices of the kids of Orang Asli Kampung Malaysia (aboriginal people) as they narrated their stories for the audience. My role, as the mediator was to build the bridge between the two parties, so they can communicate and convey their message in the most clear way.

Following up from that previous experience, in this thesis, my goal was to build a mobile application to expose the sound of cities to citizens of the world. Also, to facilitate building a bridge for people to motivate them to pay more attention and listen more to their environment as they walk through every day. This application would be a crowdsourced database of sounds and licensed under open source copyright. But, after my first prototype and during the second round of benchmarking, I came across similar applications.

My attention was drawn to the fact that the existing applications were not providing users with a pleasurable, enjoyable experiences. Therefore, this made me change the direction of this thesis toward improving the mobile soundwalk applications by the presentation of a design foundation instead of building my own.

1.2. PREVIOUS PROJECTS

This thesis was not the first time I have come across soundscape and soundwalk. Below, I have described four related works which lead me to this thesis.

1.2.1 THE FIRST SOUNDWALK

It was in year 2010, where I was studying my Bachelors at Multimedia University, which for the first time I heard the term “soundwalk” and learned about it. It was a lecture followed by a workshop by Dr. Andra McCartney where we, the students experienced a soundwalk. The soundwalk happened took place in Masjid Jamek downtown in Kuala Lumpur, Malaysia.

1.2.2. HELSINKI SOUNDSCAPE

Later in 2014, in my first year of Master studies, in order to expand my knowledge about soundscape and soundwalk I took part in a course: Sound Design and Interactive Music, which as result in my final assignment I designed an immersive environmental soundscape of Helsinki.

My goal in this assignment was to narrate different environmental soundscape sounds of Helsinki. In order to make this happen, I used the visual programming language, Pure Data (PD) and made a synthesis looking interface patch. The patch would call-in pre-recorded soundwalks consist of popular neighbourhoods in Helsinki, such as Rautatienatori, Viikki, Kalevankatu, Hakaniemi, Hämeneentie, Kallio, Alexandersgatan, and Sörnäinen. Finally, by setting up the PD patch with the surround sound speakers, I was able to map the sounds to different speakers which would enable participants to experience an immersive soundscape of Helsinki.

1.2.3. CITYBOOM

In this section I will talk about the very early stages of my previous project, *Cityboom* and the steps taken towards creating the first prototype to reframing this thesis. Let's start with the name. It was inspired by the term “boom”. It is an interesting word as it refers to several objects like: sound boom, log boom or ship boom. It also has other common meanings such as: economic boom or sonic boom. Cityboom is a concept for crowdsource mobile soundwalk-sharing application with open source software license. I wanted to enhance the perception of cities from the local's and the tourist's point of view. The idea was envisioned so that cities and their stories could connect people and their surroundings which otherwise would be stumbled upon. Figure 1 illustrates a selected set of interface prototypes of Cityboom (Appendix I).

During the past decade and due to the extend of technology expansion we have become less aware of our surrounding and more concern on the screen. We

tend to avoid the environment we interact daily (Turkle, 2011).

How can we make citizens aware of their surroundings? How can we create engaging services for our environment, specially cities? What can we perceive by listening and paying attention to our environmental soundscapes? How can we design a digital service for soundscape of a city to help us get educated, be entertained and exchange information? These were all questions I wanted to answer with cityboom.

Production Clinic: The clinic is a tutoring process and forum to create, support and evaluate students projects. Especially students who need support for their master thesis. Production Clinic is instructed by Pirjo Asiala, who has supported me during the early step of this thesis.

The very first feedback I received after my first presentation was that I should work on the concept as it sounds vague. Therefore, after I clarified the idea by taking away unnecessary terminologies and creating a simple and crystal clear presentation, I took advantage from this clinic to collect feedback in order to make progress on my work. I also used the “lean startup process”, the common design process, which is mainly used in the startup scene, where I build, measure, and learn. It emphasizes on speed as a critical ingredient for development (Maurya, 2012).

User test: By conducting this user test I wanted to collect data to understand two things. Firstly, to know if they are able to predict the location of the soundwalk in which it is being played and secondly, to receive their interpretation and experience from the exercise. As a result, it was interesting for the users to practice listening and predicting the location before it was revealed to them.

The first user tester was with Maja, a graphic designer from Slovenia. She describes her experience as: “It was really, really, really relaxing. It awakens imagination as each sound wakes up something else in my imagination”. Maja said that she was hearing certain sounds stronger than others. Like, waves, motor bikes and some people in the background. She continued that for her the sounds had a transition from smooth to strong sounds. Maja concludes her feedbacks by saying: “This is a practice I have not done before and it's very interesting how it made me relax. I started building my own thoughts and imagination and did not really listen to the environment anymore, they were like a background music for my imaginations”.

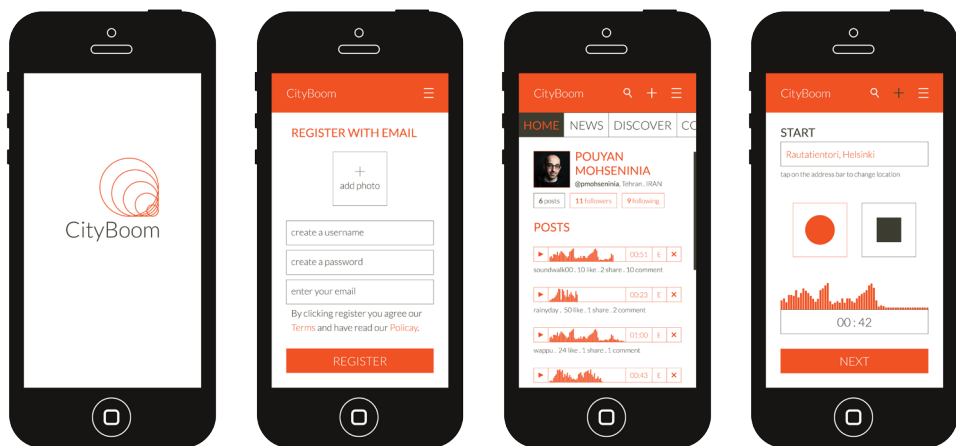


Figure 1. A selective set of interface prototypes of Cityboom.

Akbar, was my second user tester. He is researching in the area of narrative design. Akbar described his experience as: “It makes you pay attention to your surrounding. Maybe, I do that already - but maybe not. Also, for me it is interesting how things form into a story. There are times that I would feel stuck inside while I would like to be outside.” He created a story imagining himself in a factory with mechanical machines that are cutting chunks of wood. Metal chains are carrying things and putting them into an old styled truck. Akbar believes a good sound ambience is the one that you would like to continuously listen to. As one final question, I asked him if soundwalk could be considered a way of exchanging cultures? His answer was: “I think when we are triggering some other memories from a sound experience, we exchange cultures, stories and information.”

Sound seminar: This is a weekly meeting forum for sound students at Media Lab. Students share and discuss ongoing and future sound projects. I attended sound seminar to present my idea with the support of Production Clinic instructor Pirjo Asiala and the lecturer of the Sound in New Media, Antti Ikonen.

I demonstrated the application by playing a soundwalk asking them to express their interpretation. A student uses radio as an analogy to point out how different every few seconds were. Another described it as a really beautiful scenery with sound of dust. There were questions about: who are the people recording these soundscapes? Or what type of application will it be, a native, web, or stand alone?

Demoday: It is a traditional Media Lab event which takes part in the end of each semester at Media Lab premises. “Christmas Demoday” and “Spring Demoday” are the two initiatives commonly used for these events. In a Demoday, lecturers, research groups and students have 3 to 5 minute time slots to present their work and share their findings and learning experiences.

I presented the mobile soundwalk-sharing application in a 3 minute time slot at the 2015 Spring Demoday. I received a lot of positive feedback and interesting ideas which could benefit the application and was a motivation for me.

City of Helsinki: I met Riikka, during the Media Lab Spring Demoday, a senior advisor to the City of Helsinki, where she invited me to present the idea and discuss about the possibility of being funded for this project. Unfortunately, this did not happen but I was guaranteed to receive their support once the application was released. They were very interested in the project and eager to promote it for the tourists, visiting Helsinki. In addition, I was introduced to *NewCoHelsinki* which is a entrepreneurship support services from basic entrepreneurship education.

I continued my design iteration process, and research on this project. Eventually, through Stuart Fowkese, field recording/sound map artist for *citiesandmemory* I got to know about two similar projects, *Foundsounds* and *Echoes*, which I will talk about in chapter 2.

1.2.4. METROBEAT

For the 70th anniversary of the public transportation in Helsinki, the cultural production, *Taidelinja* made an open application with the theme of locality, diversity and connection. As a result, 9 international artists considering myself were selected to present their works to the public for this year's anniversary. The event was partnered by *pixelache*, Aalto University School of Arts Design and Architecture (ARTS) and Forum Virium Helsinki and also supported by Culture Ireland. My proposal was about making the public transportation fun and entertaining. I was inspired by “Scratch Mat” a project by “The Fun Theory” *Thefuntheory* (2009) and also a *Ted* talk beatboxing performance from the hip-hop musician Tom Thum (*Ted*, 2013).

The idea was to hack the public transportation card validator machine into a beat-boxing apparatus. In theory the idea sounded doable but, once I started opening up the machine and studying the boards and electrical components



Figure 2. The musical machine at Itäkeskus metro station.

I faced different challenges. Thus, I called in two of my Aato Media Lab schoolmates, Niklas Pöllönen and Fernando Visockis for their collaboration. During the whole process I had advices from media artist, Matti Niinimäki, and electronic master, Ali Neissi.

The machine was installed at Itäkeskus metro station from 17th until 27th of September 2015. During the mentioned time period, I spent several days observing the commuters pass by the machine without interacting with it. I then randomly got into conversations with a couple of commuters, it was then that I found out that travelers try not to trespass any laws or regulations. They commented that this machine is built only for validating your travel card and not to play around with. So, changing its functionality would not have been obvious unless the whole environment had changed accordingly.

1.3. RESEARCH QUESTION

This thesis aims to find answers in the area of Interaction Design for the following research question: How to improve mobile soundwalk applications for public space in cities through a participatory design approach? In order to answer this question four mobile applications were analysed by test users and

the creators were interviewed. Also, a task scenario exercise was conducted along with a paper-prototyping user test. Furthermore, a creative workshop with a participatory approach was facilitated.

1.4. THESIS SCOPE

This thesis is based on a research process with the main focus on executing a set of design principles within a participatory design approach and qualitative research.

In detail within this thesis, I will study applications in the genre of geographical identification metadata using audio and soundwalk as their core feature. I will also interview designers, developers and sound artists in a constructive and semi-constructive format. Furthermore, I will conduct a task scenario exercise along with a paper-prototyping user test and based on the findings I will conduct a workshop. Finally, as the ultimate goal of this thesis, after reviewing and analysing all the findings, I will propose a set of useful design principles for members of User Experience Design (UX), and Interaction Design (IxD) community.

1.5. THESIS OUTLINE

Chapter 1, introduces personal motivation and related works for this thesis.

Chapter 2, the term soundwalk and soundscape will be introduced and I discuss the relation of this thesis with new media. Also, I will present four soundwalk applications and interview their creators. This is a starting point to explore the problem in depth.

Chapter 3, is a critical approach toward the existing applications along with a task scenario exercise and a paper-prototype user test which has been conducted. As a result, all the findings will be used to conduct a creative workshop.

Chapter 4, is all about the creative workshop. A participatory creative workshop which I will explain the methods, and its design exercises that were used in order to build 3 concepts as outcomes of this workshop.

Chapter 5, focuses on reviewing the analysis and findings from all the works that have been done to construct the design principles.

Chapter 6, is where based on all findings the design principles will be presented.

Chapter 7 summarizes the research, and answers the research question proposed in chapter one, along with future directions.

2. SOUNDSCAPE & SOUNDWALK

After talking about my personal motivation and related works in chapter one, in this chapter I will make a brief introduction and discuss the two terms; soundscape and soundwalk, which has been coined by Schafer. I will also, introduce new media and discuss it in it's relationship with this thesis.

Moreover, in order to understand the existing soundwalk applications in a greater depth, I have made constructive and semi-constructive interviews with: (1) David Jensenius from Foundsounds (2) Joshua Kopecek from Echoes and (3) Asmund Sollihøgda from Podwalk and Recho, which the transcriptions of these interviews are available in appendix II.

Furthermore, in the next chapter, the four existing applications will be evaluated and discussed to highlight why they are not positive and enjoyable experiences for the users.

2.1. SOUNDSCAPE

Schafer (1977) states that sonic environment is our soundscape. It could be a sound or a combination of sounds which would create an immersive environment. He also explains that soundscape is any piece of the environmental soundscape which is regarded as a field of study. In addition to the idea of soundscape, Schafer (1969) who also coined the term soundscape points out that it refers to both natural acoustic environmental sounds and environmental sounds created by humans. As a classic example, the sound of rain in autumn or a combination of sounds such as the wind and thunder are referred to as natural sounds while our breath when jogging or a daily conversation in a workplace is referred to as environmental sounds created by humans.

Barry (2001) highlights, how the environment is understood by those living within it, and emphasizes the importance of our perception of the environmental soundscape, which opens a new chapter. The perception of sounds contain different factors, such as our personality, culture or religion and it may affect the result of a certain practice (McCartney, 1998). Nevertheless, as a common factor, the disruption of these acoustic environments results in noise pollution or noise disturbance.

2.1.1. FEATURES OF SOUNDSCAPE

The importance of a sound can be defined in their individuality, their numerousness or their domination which is the subject for having three main themed categories known as keynote sounds, signals and soundmarks which will be defined by the Canadian composer Schafer (1977). While Krause (2012), a musician, redefined the soundscape features in terms of their three main sources, geophony, biophony, and anthrophony. However, the definition is similar to that used by Schafer.

Keynote is defined in two different angle: (1) in music which the tonality of a particular composition is defined, (2) in soundscape which are the background sounds that other material may modulate around. They are created by nature: wind, water, forests, plains, birds, insects, and animals. Schafer (1977) found in many urban areas, the relentless noise of the traffic has become the keynote sound. In addition keynote sounds are not consciously preceded, but they act as conditioning agents in the perception of other sound signals.

Sound signals are the most significant sound which one can pay attention directly or the foreground of our soundscape is known as the sound signal. However, in soundscape studies, sound signals are contrasted keynote sounds (Schafer, 1977).

Soundmark is a term driven from landmark, and as every landmark carries it's own identity and signature so does soundmark. It is unique which makes it specially noticed by the people in that community or area. We create brands and identities to promote a landmarks and implement conservative strategy to protect the unique location. Thus, to make the acoustic life of a community unique we protect an identified soundmark once noticed. As a resonation to above, Schafer (1977) quoted “every natural soundscape has its own unique tones and often these are so original as to constitute soundmarks.”

2.2. SOUNDWALK

Westerkamp (1974) defines soundwalk as any excursion within the purpose of listening to the environment. As human we have the ability to make a decision to listen as we walk in a certain place to study the soundscape. Wherever we go we will give our ears priority. The practice of listening to our environmental sound, from a single sound to a composition of several sounds in our surrounding no matter where we are and what time we are in. As we may be in the center of the city near the train and trams, jogging around the lake in a park, trimming hair at a barber's shop in downtown street, inside the classroom of our college or

university or even while traveling from our home country to a country with a totally different language and cultural. So, it can be anywhere and at any time.

Nevertheless, as we cannot close or shut down our ears in the same way we do with our eyes. The information enters our brain and wants to be processed. Practicing our listening ability in such a way would most probably be exhausting and would harm our natural function of paying attention to sounds. Therefore, Westerkamp (1974) underlines, how important it is to design a soundwalk and practice listening and paying attention to the details. A soundwalk can be designed in many different ways as its focus would rediscover and reactivate our sense of hearing. For instance, it can be done either alone or with a friend and even in an intensive format where one would be blindfolded. Also it would be possible to do it in a small group where in the end there would be group discussions to exchange experiences.

Marshall McLuhan has suggested that since the advent of electronic culture we may be moving back to such a state again, and Schaffer thinks he is right. The very emergence of noise pollution as a topic of public concern testifies to the fact that modern man is at last becoming concerned to clean the sludge out of his ear and regain the talent for cliraudience - clean hearing (Schafer, 1977).

2.3. NEW MEDIA

“What is New Media?” is a question that Lev Manovich, has published several books about. Manovich (2001), as the popular definer of new media identifies it with the use of a computer for distribution and exhibition, rather than with production. Meaning an image distributed on a display of a computer is considered new media, but an image which is distributed on a paper using a computer is not, it rather is old media. In addition, in the next paragraph of his book Manovich emphasise on why we should not limit the definition of new media by honoring computer for its role, as a machine exhibition and distribution for media, over the role of a computer being used as a storage device or a tool for media production. They all have the same potential to change existing cultural languages (Manovich, 2001).

Another definition of new media can be commonly known as contents that are available for users via the internet and accessible on any of their digital devices, along with creative participation of user interaction (Vogt, 2011).

New Media is characterised as: (1) Being a digital computer-based representation composed of discrete units (2) when it is generated from a

digitization process of old media, it may imply a loss of information (3) can be randomly accessed (4) it doesn't lose information quality in successive copies and (5) it is interactive (tautology in computers).

Thus, soundwalks that are recorded using a digital device to create content and that are available via the internet at anytime and anywhere are how new media is defined. What will be mainly discussed in this thesis is not this obvious, but rather the creative participation of user interaction and how this interaction could provide a positive and enjoyable experience in such new media practices.

2.4. SOUNDWALK APPLICATIONS

As mentioned earlier in this chapter in order to bring more insight to my thesis, in this section I will introduce 4 soundwalk applications. Additionally, I had the opportunity to interview the people behind these applications where the transcriptions of the interviews are available in appendix II.

2.4.1. FOUNDSOUNDS

Foundsounds is a free mobile application which was released in late 2014 and today the version 2.1 is available on apple store for iPhone, iPad, and iWatch devices. David Jensenius, the creator of this application describes it as “a space dedicated to finding, sharing, and discovering sounds” (Foundsounds, 2014). He has created other applications during the past which have been actively involved in the scene of soundscape and sound art.

In September 2015, I had an interview with David via Skype. The goal of this interview was to collect additional information from the creator's point of view. In this interview we talked about David's background, his vision for this application and his point of view about soundwalk.

David is an experimental music composer coming out from the school of John Cage. He uses collage techniques for composing and nowadays a lot of foundsounds content as well. His goal for making this application is to make soundwalk recording process easier. He is also curious to know what would non-professionals record and is looking forward to see what will emerge from it. This application has two other features says David. One is geotagging, where a user can create sound collage using up to 5 different sounds from a region. These collages change all the time as new sounds are emerging. The other feature is “soundwalk”. It is a temporal collage experience which is almost like an echo. So, as a key element, the user hears the present, but with a mix of past. David considered his application

as an artistic project. Even though the website might give an startup impression and he is living in Ontario where there is a huge startup community. But, at the moment he is not interested to transform foundsounds into a business model nor to add any gamified features. Instead, he loves to work with communities to help build sound installations and see what will happen in the future.

We also talked about his point of view about human communication, people from different parts of the world interacting within a similar platform. Wherein David pointed out an interesting example. For him, in the context of geographics, it is interesting to hear what a street in Florida sounded like yesterday and how a karaoke bar sounds like in Malaysia on another day. Therefore, it is part of his curiosity to see the emergent of people all around the world and investigate what brings them to this application.

David then talked about his experience presenting the idea in a UX conference, where attendees approach him to emphasise the importance of such exercise and the effort to listen more instead of just going through the environment. What David wants to see people taking away from this application is a way to slow down and listen a bit closer. He hopes people either use the application or learn from it to listen and practice listening.

We end the interview with David's perspective on such exercises affecting cultures and bringing cultures closer. He believes we have already experience that from 1950's with Cage and even before that as the general goal of music.

2.4.2. ECHOES

Joshua Kopecek is a creative professional who works with sound and music. He is the director of Echoes which is a free geolocate audio project.

Echoes as a platform enables the freedom for creators to define how people interact with their content and also to sell their content as well. The project has been funded by Danish Embassy in Hanoi's Cultural Development and Exchange, and was crowdfunded on IndieGoGo. With Echoes, people can make virtual city tours, audio guides for museums, geolocated video experiences, interactive treasure hunts, accessible information for the visually impaired, and much more (echoes, 2014).

The idea says Joshua, was back in Hanoi, Vietnam, where he was living 2 years ago. But, Sonicmaps, which was a mobile application is where Joshua and his team started the initial project leading to Echoes. He has dedicated the whole past year on Echoes. During this time the product has changed and the team has

grown. Hanoi soundwalk is the first project which was created using Echoes. Then we started expanding the project to where users can easily create and add their own content. But, what has really been considered a challenge for Joshua, was creating the business model. He envisions a bright future for Echoes. Where in the future the service would be directed towards virtual reality (VR) and 3D (dimension) experiences. Recently, he started to define a research project to find out: What is the best design for the users to experience the content? What is the experience that the users wants?

On a separate note, I asked Joshua about the current statistics of Echoes. Based on his reply in February 2016, on the creator, Echoes has about 300 registered users, which 20% have been active users in the last month. More specifically on Android operating systems there have been 218 downloads, with 50 active users. While on iOS (originally iPhone operating system) 181 downloads have been recorded, but it's more difficult to track active users on iOS. Not a lot of content has been created or upload on daily bases, but only in January 2016 there have been 151 logins reported.

2.4.3. PODWALK

A two man power company, Asmund Sollihøgda and Simon Bergkjær. Podwalk is a site specific podcasts application that was developed within 6 months. It helps tourist with audio guides, like a tourist guide, to explore the city. The application uses the GPS (Global Position System) for outdoor location search and beacon, a device which performs actions when in close proximity of other devices and mainly used indoors (Danova, 2014). The application is currently free for listeners, but content creators and/or producers are to pay 200 euros, or 1/10th of the cost of creating their own technology say's Asmund.

Asmund, who is the co-founder and the designer of Podwalk and Recho (I talk about Recho in the next section) speaks about their latest achievement as becoming the 1st runner up at Creative Business Cup 2015. "We were and are a small group of two. But we were competing with teams which for instance had 8 PhD students on board. The competition was very tough. Fortunately, we won. The reason they selected us as the winner was in regards of our scalability and poetic approach toward narrative storytelling." Asmund continues, this achievement gave us the confidence to continue the project.

Podwalk is a traditional podcast player merged together with audio gathering system, says Asmund, where all the design choices are about making a simple,

and intuitive approach with a focus on content creating as a core rather than a visually appealing application. He pointed out that currently, everything is done manually to keep a closed ecosystem. We only exist for three months.

We then continued our interview about how they create their content, Asmund replied we are working with contents that have been already created. For example, recently we have been promised by Guardian to receive 30 to 40 sounds from their database. But, in general we contact museums to create their tour guides. We provide them with several options to create their content. The 1st options is to connect them with external producers, second, they can produce it in house, and third, they can send us their script, so then we produce the content for them.

He want's Podwalk to be considered as a software and technology service company, rather than a content producer. We want the museums to buy our service as if they were buying an alarm system, or smoke detection as part of their infrastructure. We sell a service, maintain and support it, but it's them who would produce the content. As mentioned earlier this application uses GPS coordinates and beacon technology, but what makes Podwalk different is its Beacon technology where instead of using proximity signal it uses pre-set room sizes beacon signal. Meaning that the audio/voice provides the guidelines which enable us to have a linear storytelling approach. Thus, as a user centric method, the user just needs to follow the story, while we take care of all the technology aspects.

I asked Asmund about their current clients and how they have approached them? He stated this is not a secret project, but at the moment we haven't made much of a noise with the social media to promote our service. On the other hand, we have made customized presentation/mockups for more than 400 different museums located in Sweden, Norway and Denmark. Not to mention, soon we will start approaching Finnish museums too. As a result, there are 25 interested institutions and 35 which are interested but still with some doubts about their final decisions within only one month (January) time period. We are not only building a site specific storytelling application but we also want to disrupt the museum industry by our service.

Asmund believes that museums have not caught up what their users need. He continues, museums are using painkiller instead of creating vitamins, meaning that they either buy a hardware like traditional walkman era or they create their own application. This costs thousands of euros and in terms of distribution, marketing, user testing and even maintaining their platform it will not be feasible. Instead what Podwalk offers is the vitamin. Firstly, our price is

99% less than building their own platform. Secondly, our platform is user facing, not client facing. Thirdly, we are in direct contact with users. We put the content for them manually, instead of an automated system. Even though we are aware there might be issues when our service grows and reaches more than 200 clients. But, It is worth it and would have a higher impact for the user.

I then asked Asmund about his point of view about storytelling as in podcasting? He strongly believes podcasting is the radio format of the future. Based on their research, during the past 5 years, podcast has grown 20%. Also, 17% of US citizens listen to podcasts every month. Which is still a high percentage in a country with 318 million population. He thinks this format will take over on demand, as how today watching TV has changed. People tend to be less on TV, instead they watch in special occasions like the super bowl, Oscar's or music awards.

Then, I asked Asmund, what he thinks about mobile soundwalk applications? He pointed out that in order to expect users to produce really good content, the platform needs to facilitate them with an extensive set of tools for editing. Also, both the content creator and the listener need to be rewarded. Asmund provided examples to his statements. For example, podcast helps you to learn and get entertained or music helps you to set your mode or enables an environment for concentration. Therefore, it is hard to install core functionalities on mobile soundwalk applications. Since, media consumption should have different benefits and affordances as their core functionalities. So, even though I am in the “super” target group but still I will not be interested nor would spend time using it.

In the end of this interview, Asmund concludes his words by saying I am very confident about Podwalk. The main reason that makes Podwalk interesting is by taking a specialist out and telling stories for the user in order to provide them with in depth understanding. The second reason is enabling users to fully engage with their surrounding to create a unique and reproducible experience.

Asmund then ended this interview by this statement: “Transforming technology into an activity gives the user the experience that doesn’t have technology at its core experience, but rather the content.”

2.4.4. RECHO

What if a story belonged to a place and you would have to be at that exact place to hear it? (Recho, 2014). To answer this question and to get to know more about Recho, I interviewed Asmund Sollihogda, creator and co-founder of Recho. As mentioned in the previous section, Recho is another application along with

Podwalk, created by Asmund and transmedia-producer Mads Damsbo. Below is a summary of this interview.

There are different section on their website, explaining how to use, describing its feature, and pricing for Pro's. Recho is a site-specific content application. Free to download and listen but, content creators need to pay.

I asked Asmund, how Recho was born? He answers: The application was published in November 2014. I had won a competition for the concept and after the investment was made, it was an easy process. I hired developers and I made the designs myself. So, what did you gain as an experience with Recho, I asked, and he replies: during that period of time, I was totally in a product mode, without paying attention to the whole system. I was lacking a lot of knowledge. Asmund adds, I think what makes Recho interesting is the fact that I build Recho without taking anything for granted. He then continues, meanwhile, important questions were never clearly answered. Questions such as: How to get people using Recho? What will they experience? What will they record? Thus, our main challenge with Recho was how to describe to people what to use it for, and what to record.

Asmund says today I understand that we had a wrong approach with Recho. We believed the best way to answer the questions is by just trying it out. Not to mention our advisors had the same belief too. With today's experience my approach will be very much based on analytical design. A participatory design approach, where the user is in the center of our design. Also to add, another difficulty we had with Recho was that it is audio time based media and not visual.

I then asked Asmund, what he thinks as a solution to such audio time based media products? He answer's: for example if you look at twitter, there are certain rules applied and has become intuitively impeccable. Also, today we use Instagram with a certain format. Meaning they have an entity, whereas with Recho we never captured a closed entity. So, I think with audio as a multimedia experience, it is similar to what theater is as an experience. The place is your stage. The audio is the actor and wind or any other sound layers become elements of that scene. Thus, we can consider Recho is a tool for a specific target group. Leah Barclay is one example, I believe she produced the final product in its best by using Recho as a tool.

Asmund concludes his words by referring to the 90-9-1 rule. It would be too demanding to expect users to create content for soundwalk mobile experience. But instead, they can be consumers. Thus, create a great application to cook a great food for the consumers.

3. CRITICAL APPROACH

In chapter 2, four soundwalk applications were presented and interviews with their key individuals: (1) David Jensenius from Foundsounds (2) Joshua Kopecek from Echoes, and (3) Asmund Sollihogda from Podwalk and Recho was conducted, in this chapter, within a critical approach, I will discuss why the current state of mobile soundwalk applications need to improve their design.

A field exercise was conducted and participants were asked to fill in a survey which will be discussed. This survey was made to understand: (1) user engagement level and (2) public awareness about soundwalk which the results help to understand the end-user of such digital products. Additionally, to understand the end-user even deeper, I took part in an interface prototyping course at Aalto Media Lab, and within a group, we created a paper-prototype and tested it with 4 users which the results are discussed. Finally, in this chapter I will also discuss the results of the interview conducted in the previous chapter.

Based on empathic design and user experience ecosystem, below I have underlined my design critics from the interviews with David, Joshua, and Asmund, and also testing the 4 soundwalk applications along with my personal project, metrobeat.

Empathic design is described by Brown (2009) as the heart of design, empathy helps designer to have an understanding of what others see, feel, and experience and without empathy design is a pointless task.

Ecosystem thinking helps a designer to design the environment accordingly. As what Dave Jones highlights in his article in uxmag: “Stop thinking of specifics and focus on the user experience (UX) ecosystem”. Jones also introduces 3 major implications of ecosystems thinking as: (1) Users as participants (2) Interfaces as mediating proxies, and (3) Relationships as agents of change (Jones, 2012).

Foundsounds: (1) super late responds to one's action, either the playback button or stop. (2) Leaving the user without options to chose is always dangerous and may cause them abandoning the service. In Foundsounds, while a user is in the middle of a process to submit their content, they are left alone without a back option.

Echoes: (1) I never got to hear a sound, (2) As a user I always felt alone, as there were no instructions and as a result I had to make lucky choices which was

really frustrating, (3) It was after several attempts where I found the play button, but instead I should first download the content before being played. Afterwards the system still didn't play the sound or crashed and (4) I was asked to plug-in my headphones, what if I want to use speakers?

Podwalk: (1) The application is free for the listener, so, If a user wants to submit a soundwalk/content they are asked to pay, (2) Some contents were not in English which as a user I was expecting to be provided with option to choose.

Recho: (1) A user must be in a zone to hear the soundwalk, otherwise there is no content to experience which leaves the user with 2 options: (a) to leave the application or (b) submit a recho (soundwalk). Even then, the user will leave since there are not much content for exploring and experiencing.

Metrobeat: (1) It was really hard to see the machine in the first place as the location was not well defined. (2) Users felt weird and/or embarrassed using the machine, since the environment needs to be set for such experiences.

3.1. TASK SCENARIO EXERCISE

After underlining my design critics on soundwalk applications (foundsounds, echoes, podwalk and recho), I decided to run a task scenario user test in order to understand users engagement during their interaction while creating content for a mobile soundwalk application. As described by Nielsen (2014), task scenario user test is the most effective way of understanding user's need and the essence of usability testing. This practice provides qualitative insights into what is making trouble for the users to help how to improve the design. Therefore, I designed a simple task and made a public announcement via the social media, calling for volunteer participants for a soundwalk recording session. Participants were then provided with instruction and the scenario to record a one minute soundwalk of their city (either living in or traveling to). Each participant had to find the most convenient recording device they may have around. After their completion of first task, participant would submit their soundwalk along with a data set as their second task. The data set should contain: (1) name (2) age (3) nationality (4) residency (5) time and date of their soundwalk, and (6) a caption for their soundwalk. This exercise was recruited by 21 volunteered participant who completed the given tasks and filled in the survey as their final and third task.

3.1.1 TASK SCENARIO EXERCISE SURVEY RESULTS

This survey enabled an overall understanding and evaluation from the public. The main questions raised were: (1) How many people are familiar with the term soundwalk? (2) How comprehensive the instruction was? (3) Was the one minute soundwalk recording exercise, engaging for them? (4) How many would still be interested to record another soundwalk after this exercise?

Below are the results of all 21 participants:

- (1) 66.6% of the participants did not know what is soundwalk and got to know through this exercise. Meaning only 33.3% of participants had previous knowledge about soundwalk.
 - (2) An overall score of 4.5 out of 5 was submitted for the clarity of the instruction, not to forget the fact about more than half of the participants did not know about soundwalk beforehand.
 - (3) An overall score of 4 out of 5 was submitted, proves this experiment was indeed an engaging exercise from its participant point of view.
 - (4) 90.4% are interested to take part for another soundwalk recording exercise.
- In conclusion to this section, as long as a task is designed simple with enough and clear instruction, it will be a pleasant user experience and the user can engage with the service.

3.2. PAPER-PROTOTYPE WORKSHOP

I wanted to expand my knowledge on how to run a user test and use collected data to support my design process. I registered for a workshop/course called Interface Prototyping, at Media Lab.

Paper-prototyping which is also known as low-fidelity (lo-fi in short) can dramatically increase quality as it is fast, and allows a team to constantly iterate and try more ideas (Rettig, 1994).

During this workshop I had the chance to bring up the topic and form a team of 5, including myself. We went through several design iterations and finally, each member created their version for a paper-prototype for a mobile application for sharing soundwalk of cities (Figure 3). Through a voting system one idea was chosen to develop further for user testing. In our final version, our distinguishing feature was gamification. This makes the user match a soundwalk with a city. The target group was defined for adults and our goal was set to test the usability of a gamification feature in mobile soundwalk application (Appendix I).



Figure 3. Designing interfaces during paper-prototyping course.



Figure 4. A user test session, showing the facilitator and the test user.
Photo by Sujin Hwang

We selected 4 volunteers for this user test, but before inviting them for the test. We had to go through a couple of steps to be prepared. Step one was to prepare 4 test scenarios which were: (1) Play a sound (2) You are listening to sound number one but you want to listen to sound number six (3) Listen to the most interesting sound and try to find out where it is from and as the final task, (4) Load a different set of sounds. Step two was to assigned each team member with a certain role (workshop leader / facilitator, greeter / usher, computer, and 2 team members as observers). And the final step, step three, we had to practice for several times to get used to our roles and get familiar with the flow (Figure 4) (Rettig, 1994).

3.2.1. PAPER-PROTOTYPE RESULTS

The collected data from our user test enabled a comprehensive understanding from the end user point of view. Based on the survey results, the whole system received an average of 4.25 from 5 (Figure 5). In detail the system was easy to use, learn, and navigate. But, the system did not have all the functions users expected and also, it was not clear for users how to use it. The overall results were positive and users found the gamification feature interesting. They were satisfied with the system and would install such applications on their device(s) (Appendix I).

Based on the interview results the whole system was understood as just another sound player and the gamification feature was not convincing to the users as a game, but rather an additional feature to the sound player. In detail below is a list of concern defined from the user point of view:

- The navigation system fails with the users, who entered the quiz not having understood the concept (accidentally). Users want to go back to quiz view from the right/wrong answer page.
- User's lack visual feedback, when sound is playing (waveform). Also for the right answer in right/wrong answer screen, users lack “play button”.
- Sound should play automatically when a sound is clicked on the playlist.
- Users expect to see the name of the sound on the top of the screen (standard audio player mental model).
- Placement of the “new soundwalk” makes it feel its the title of the sound that is playing.
- Users do not use forward/backward at all.
- Sharing is very important. Users had different demands for that: not only publically sharing, but also personal sharing with a friend and even exchanging your own soundwalks.

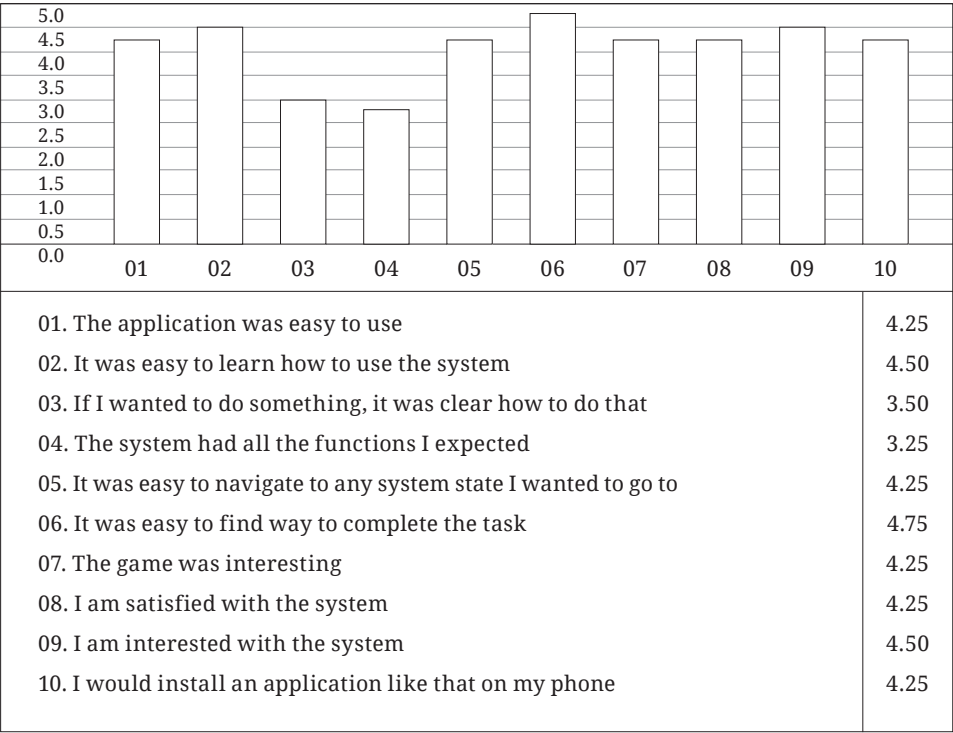


Figure 5. End-user point of view about the system.v

- Great demand for a “record your soundwalk” option.
- Users wanted to hear all the sounds from the city which is the right answer.
- Users tend to start browsing photos immediately (may be a flaw of proto - lines as a placeholder for the text).
- It is not obvious from the proto if there are only 6 sounds on one screen or do you have a possibility to scroll down.

3.3. REFLECTION ON SOUNDWALK APPLICATIONS

4 interviews including David Jensenius, from Foundsounds, Joshua Kopecek, from Echoes, Asmund Sollihogda, from Podwalk and Recho were made in which one was in constructive and the other 3 were in semi-constructive format. 4 different applications were introduced and discussed. 2 application ideas were set for art based projects whereas the other 2 were built with a business model.

- From foundsounds interview, it was clearly mentioned by David that at the moment he does not have any interest turning his project into a business

model nor add any gamification features. Whereas, Podwalk is the second product from Recho Aps. Meaning, what they have learned from their first product, Recho, are in fact results to what they have in their second product, Podwalk. This similar development approach can be seen in Echoes. It has been mentioned in the interview, Sonicmaps, was also their first product which lead to Echoes.

- As a result it is important for a team / individual to constantly improve and development their product. In addition, if your product doesn't provide today's need that improvement/development can be reflected into a new product.
- In all interviews enhancing the process of soundwalk recording has led to products which are meant for helping professional and nonprofessional users. Such enhancements also, help to build a community and a culture for practicing soundwalk and listening more frequently. A way to listen more instead of just going through the environment as what David emphasises in his interview.
- Joshua and Asmund both highlight the importance of user experience. Joshua is looking forward to propose a research where he says: "What is the best design for users to experience the content?" and Asmund believes Podwalk "enabling user to fully engage with their surrounding to create a unique and reproducible experience."
- Such research and experiences will definitely be a step toward constructing a guideline and set of principles for mobile soundwalk applications.

4. PARTICIPATORY DESIGN

Based on the findings from the critical approach presented in chapter 3, it became obvious that there is an interest as the participants were engaged and are willing to record more soundwalks in the future. But, as the existing applications are not fully engaging their users and there is not a clear connection between the designer and end-user, I decided to investigate it by questioning, why? and in order to that I facilitate a creative workshop to improve and make the next step for designing a foundation for mobile soundwalk applications within a participatory approach.

Thus, in this chapter I will present and discuss the creative workshop. The goal of this workshop was to apply participatory design approach to create personas, storyboards, and concepts. Also, as part of this workshop all the 4 applications were tested by all 9 participants within their groups which the results are discussed in the next chapter.

Participatory design, which can also be known as co-operative design and nowadays often called as co-design is the attitude where all the stakeholders (in this context, stakeholders are individuals or group of people with the same interest, end users, designers with different disciplines, thinkers, doers, and citizens) are brought together in order to solve a challenge and/or help provide solutions meeting their needs (Sanders & Stappers, 2008). Additionally, Val, et al. (2015) suggests, working within a participatory design environment, designers tend to become more creative and innovative than they would be on their own creating ideas. Not to mention, that this important happens through several design exercises, set specifically for a particular scale of participants, with a defined set of goal(s).

Following the participatory design approach, it was my intention to involve potential users in the design and understand from their perspective what needs to be done in design to provide an engaging soundwalk experience. Therefore, I decided to conduct a workshop and planned to invite volunteers to participate in it. In order to have a group of people with diverse background, I created a doodle along with a short description of my thesis topic and the goal of the workshop. It was shared via social media and I had 9 volunteer participants which consisted of 3 females and 6 males between the ages of 20 to 40 years old.

As this was my first experience to facilitate a workshop I started by researching

design methodologies and examples available from various design agencies and also art and design schools. Design agencies such as Frog, Fjord, Ideo, and Nesto and Art and Design schools such as Aalto school of ARTS and Stanford institute of design. At the same time I started looking for an assistant, an experienced person to help me out with this workshop. Fortunately, Mathijs Provoost, a classmate of mine at Aalto Media Lab, kindly accepted my offer. We then worked together to make this workshop happen. On the other hand, with the tight schedule of the participants, the only available time and date was on Saturday 12th of March 2016 and The location was Aalto Media Lab premises, 4th floor, room 414.

4.1. CREATIVE WORKSHOP

A scheduled 4 hours workshop which instead ended to be 6 hours. The initial plan of the workshop was to start at 10:00 in the morning and end at 14:00 in the afternoon. But, instead it ended at 16:00 in the afternoon. The reason for this was the interest that the participants showed by spending additional time to discuss the topic, workshop and their concept designs.

The workshop started with an icebreaking exercise (Figure 6), where each participant had to illustrate and present who they are by using a fictional or so called superhero character. Participants were then divided into 3 groups of 3. According to participant's background, I had composed groups with varied but complimentary experience, qualifications, and skills.

In order to bring everyone on the same page, firstly, I presented the project in brief, then defined what soundscape and soundwalk are, next, demonstrated Cityboom as the first prototype and finally, shared the collected data from the field experiment survey.

Concerning to clearly attribute the problem, as the next step, user tests were conducted to test all the 4 applications (foundsounds, echoes, podwalk and recho). Afterwards, the kick-off for the brainstorming started where we asked the participants to have fun, turn off their personal critic and start building on top of each other's ideas; silly or insane ideas that can be a starting point for their concepts (ideaspector, 2013).

Moreover, once the groups had created their personas, storyboards and concepts, in order to test the ideas and collect constructive feedbacks, they were asked to exchange their whole concept material with the other group. So, the other group would reflect upon their concept by highlighting its strengths, weakness, opportunities and threats (Hill, 1998).



Figure 6. Participant illustrating their favorite fictional character.

As the final stage of Playground, each group had five minutes to present their final concept and each group mate had to showcase their concept idea in one viscous sentence. Finally, at the end of the workshop, each participant was asked to point out the best and the worst experience they had in this workshop and also to rate it on a scale of five. The results are available in the Discussion section.

4.1.1. USERS TEST

After everyone had presented themselves in their superhero character, groups were formed and they organised themselves in their designated space. I presented



Figure 7. Mathijs is presenting a method card during the brainstorming.

the 4 applications (foundsounds, echoes, podwalk and recho) and asked each group to conduct a user test from the digital devices which had been equipped and ready to use to find out the pros and cons of each application. Moreover, in order to compile their findings and present them as a team, each person within their group had to discuss their findings as pros and cons for each application. All group presentations will be discussed in the next chapter.

4.1.2. PLAYGROUND

There was a 5 minute break before starting the playground. To start the ideation phase (playground), the identified problem was clarified to everyone. I asked each group to write down the problem as “How can we improve mobile soundwalk applications for public space in cities?” And asked them to keep it on the table as a reminder.

Ideaspector: this is a master thesis by Ahola (2013), done in Aalto university which I was inspired with. It is a set of cards of creative viewpoints for triggering innovative ideas. 17 different method cards were selected based on their impacts and presented during this phase (Figure 7) (Appendix III).

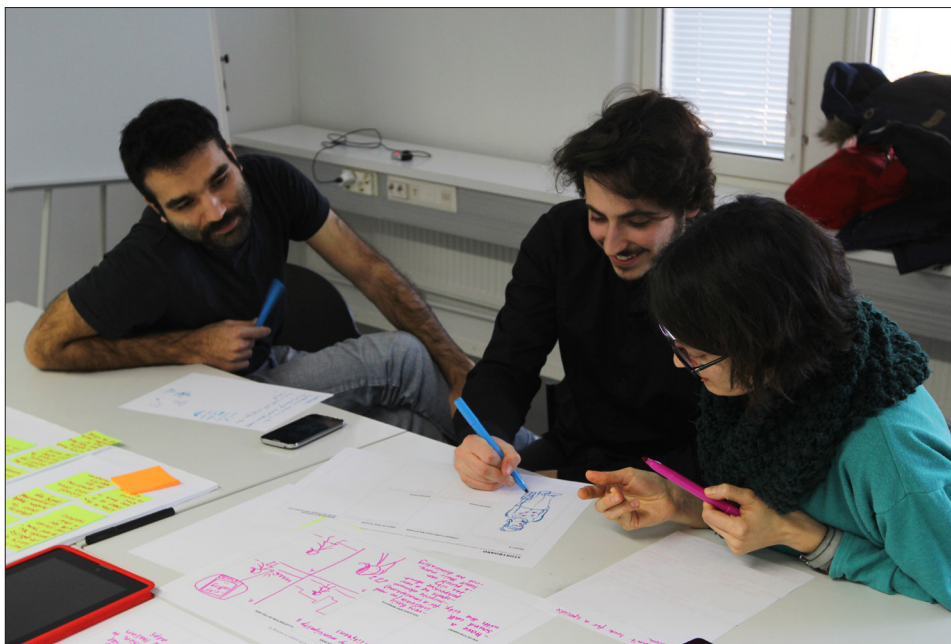


Figure 8. A group while building their Storyboard.

4.1.3. PERSONA

While each group was busy generating ideas, it was important to facilitate the groups to create personas. This tool enabled the groups to define the person or group they are working for by visualising its key characteristics, and reasons he or she would engage or may not engage with this service (Tassi, 2009).

After the tool was presented, persona template sheets were provided for each group (Appendix III). During this workshop we built 3 personas, meaning that each group created one.

4.1.4. STORYBOARD

After generating ideas and creating a persona, it was time for groups to start creating their storyboard. This tool is to collect input and manifest every touch point, and also to ensure the work is relevant to people or users in the creation of the experience (Tassi, 2009).

After the tool was presented, storyboard template sheets were provided for each group (Appendix III). During this workshop we built 3 storyboards, meaning that each group created one (Figure 8).



Figure 9. A group while creating their Concept Canvas.

4.1.5. CONCEPT CANVAS

By now we have generated ideas, created a persona and a storyboard. Thus, by concept canvas we enabled the groups to evaluate their service. Concept canvas is like a simulator, it provided them with general overview and enough details to make decisions, to tweak, improve or move on with another idea. This tool also provided an opportunity for groups to understand how their service can be perceived by consumer needs in reality. Concept canvas is also known as service poster or concept poster as well (Tassi, 2009).

After the tool was presented, concept canvas template sheets were provided to each group (Appendix III). During this workshop we built 3 concepts, meaning that each group created one (Figure 9).

4.1.6. ANALYSIS & CRITICAL THINKING (SWOT)

Developing a clear plan, requires analysis & critical thinking. Which is known as SWOT (Hill, 1998).

This tool will help the groups to evaluate their situation and clearly see options ahead. Therefore, to evaluate equally and criticise fairly, we asked each group to swap their persona, storyboard and concept with the other group. This



Figure 10. A group while Analysis & Critical Thinking (SWOT)

tool is commonly known within the Service Design scene as SWOT, an acronym for Strengths, Weaknesses, Opportunities, Threats.

After the tool was presented, analysis & critical thinking template sheets were provided for each group (Appendix III). During this workshop we analysed and criticised 3 concepts, meaning that each group applied this tool to reflect on the other groups concept, storyboard and persona. Finally, once each collected back their feedbacks, they had to finalise their concepts and prepare for the final presentation (Figure 10).

4.1.7. PRESENTATION & CONCEPT THREAD

Each group had 5 minutes to present their concept. This exercise would help build the confidence of the groups about their concept and also to practice hearing out loud and making sense of it.

Additionally, each individual was asked to describe the concept they were building in a catchy and short statement. Metaphorically, it can be referred to as what we post for instance on Facebook, Twitter or even Instagram. The final concepts are presented in Workshop Outcomes in this chapter and concept threads are available in appendix III.

CONCEPT

I want to collect input from others / to ensure my work is relevant to the people I'm working for

CONCEPT NAME	KEY STAKEHOLDERS	ILLUSTRATION OF THE IDEA
-City calling	-city municipality -citizens	
VALUE STATEMENT	FEATURES AND BENEFITS	
-Have a sound call with the city.	-very basic interface (no need for a smartphone) -surprise element -opens up a new perspective about the city -a person can leave their mark -not too dominating	

Figure 11. Citycalling concept canvas.

4.2. WORKSHOP OUTCOMES

During this 6 hour workshop 3 groups consisting of 3 members each built 3 concepts which were then presented. These concepts are entitled citycalling, once..., and Soundtrace, that are presented in this section.

4.2.1. CITYCALLING

This concept is more than just an application. The idea is based upon the possibility of creating a service for people who are non-smart phone users and senior citizens or basically people without technical skills. This service brings in the basic interaction - like back in the days where we had basic phones, instead of today, where we deal with different options for communication (Figure 11).

The concept's core feature is around the idea of communicating with the city you are either living in or traveling to instead of people communicating with people. The user will receive a call, if they accept their call a story will start to be narrated for them which has been recorded beforehand. A user can either pick up a call or dismiss it, based on whether the user would like to experience or not. Since it is a phone, it requires a space which you would walk through and listen

unlike a concert hall where you would sit and listen.

As special places will add a value to the experience, a user will need to walk through a city to have a full experience. It's more about interacting with the city and its surroundings rather than people interacting with people. This service tries to connect people with the city. An indirect approach to what and how other people have thought about the city rather than directly connecting a person with another one.

It is important to mention ambient sounds can be muffled, but this service intends to build a personal interaction that is based on listening to people who tell a story, even though it may not have a completely clear sound. But, it is the textual that creates a unique experience, and can even be considered as interesting as a collage. In addition, what people tell as a story can possibly be more interesting and entertaining than listening to a novel being read.

Feedback: One important question is how would the quality of the playbacks be, and also, should a user use a headphone or the phone's speaker?

4.2.2. ONCE...

The idea of this application is not only based on soundwalk but a also a collaborative approach for creating story and storytelling along with soundscape and soundwalks (Figure 12).

Snippets of stories are created in collaboration. Once a user has recorded snippet of a story it will be shared via a common platform where other users can create a full story known as a clip. Others can enjoy listening to the stories by hitting the play button if not willing to collaborate. In addition, there is still another option for users to engage with this platform. A user who is compiling a story could add a geographical identification metadata to a clip. So, if a user wants to experience a story at its location, they would have the possibility as well. Also, based on a compiled story, a user could create a soundwalk for it.

Feedback: Some features of this concept were eliminated after they received their feedbacks. As a result a template will be designed to guide the users for creating snippets of stories and clips and to avoid confusing stories or low quality stories. Also, the possibility to add tags to a clip for searching purposes in the database and geotagged in the routes should be added as well.

Another interesting idea would be “purchase a story” idea. To motivate users to

CONCEPT

I want to collect input from others / to ensure my work is relevant to the people I'm working for


CONCEPT NAME ONCE... 	KEY STAKEHOLDERS PEOPLE INTERESTED IN STORYTELLING. PROFESSIONALS AND NON- PROF.	ILLUSTRATION OF THE IDEA ●) RECORD A STORY CLIP AND SHARE ●) COMBINE OTHER PEOPLE'S STORIES INTO A FULL FLEDGED STORY (WITH OR WITHOUT GEO-TAGGING) ●) LISTEN TO A STORY - JUST PRESS PLAY - OR FOLLOW A ROUTE ●) CREATE A SOUND TRACK
VALUE STATEMENT CREATING AUDIO LITERATURE THROUGH THIS APP.	FEATURES AND BENEFITS RECORD + SHARE GEO TAG FAST SIMPLE TO USE NARRATIVE BASED COLLABORATIVE COMMUNITY BASED	

Figure 12. Once... concept canvas.

participate in creating new stories to put on store to be sold. Rating system for users and stories will also be applied in order to have more relevance toward quality content. For instance, a user could be defined in levels of expert, veteran or novices.

4.2.3. SOUNDTRACE

Soundtrace generates stories using soundwalks. It combines several soundwalks automatically from a certain city to generate a story. It might be interesting and engaging for the user or it may not! It's up to experience and explore to find interesting traces of a city (Figure 13).

The application uses the soundwalks from its database, consisting of hundreds of city soundwalks to create stories. By using an algorithm the system would randomly selects 6 to 7 different soundwalks of a city. It will merge the sounds together via an inbuilt editing system and algorithm to generate stories.

Feedback: The initial idea was to enable several features for user but after the analysis and critical thinking exercise they were eliminated and one feature was then the focal point of this application.

CONCEPT <small>1 I want to collect input from others / to ensure my work is relevant to the people I'm working for</small>		
CONCEPT NAME SOUND Trace	KEY STAKEHOLDERS Ppl - recorders & story tellers, interaction, cultural practices (anthropologist....)	ILLUSTRATION OF THE IDEA
VALUE STATEMENT - User interaction and involvement - Mind triggering - Immersion	FEATURES AND BENEFITS - Generative story tells - FICTIONAL SOUND OF FUTURE - AR sound reflecting intangible content (method) - Memories of sound (coming in 5 years) - TOUR of SENSES - Social broadcasting (method)	

Figure 13. Soundtrace concept canvas.

4.3. WORKSHOP DISCUSSION

At the end of the workshop, each participant was asked to rate (on a scale of 1 to 5) it and also to point out the best and worst experience(s) they had. Based on the results (Table 1), the average rate for this workshop was 4 (out of 5).

All the participants were then invited around a table to start a discussion on “The Workshop and Final Concepts”.

I started the discussion by raising the question: “what do you think about the topic? Is it an interesting area, and could it be used in our daily life?”

Camilo, answers me with a big yes. As a sound artist and designer he is actually in the “super” target group. On the other hand, Leda, had a very interesting point of view “I was not interested in the topic before, but now, after this workshop, it is more interesting than what I expected. It makes more sense now that I have experienced different aspects of it.” “So Leda”, I asked, “will you use your own service?” Answered: “Yes, why not! I would like to experience it.”

Aliakbar, shared that he has learned a lot from this workshop. He specifically pointed out on (1) user experience and (2) benchmarking. “We think about these two but not in a constructive manner. What happened in this workshop

BEST EXPERIENCE	WORST EXPERIENCE	RATE
<ul style="list-style-type: none"> • Playing and combining of different peoples ideas. • Good exercise for concepting. • Good exercise and effective instructions. • Well organized, good structure, good material. • Planning and material. • Idea cards made us brainstorm in different ways. • The brainstorm was very good. Cool inspiration slides. • Learnt new stuff. That moment when misunderstanding created new ideas. • Food, refreshments, coziness. 	<ul style="list-style-type: none"> • Too much explaining about ideation at the beginning. • Why on a Saturday morning? Could have been a more convenient time. • Too many exercise, too time pressure and "bit too long". • A bit fast, less feedback. • Idea cards. You felt constrained in your thinking. • We had many great ideas but they were very different and not enough time and space to really juice them in a meaningful way. • Specify you have to swap concepts with other. We had to choose the concept so quickly. Too many good ideas in the brainstorming. • The glitch in the process was that we didn't know about the swap of sheets. Would have tried to be a bit more clear. • We should have gone for a walk. 	<p>3.5</p> <p>4.5</p> <p>4</p> <p>4</p> <p>5</p> <p>4</p> <p>4.5</p> <p>4</p> <p>4</p>

Table 1: Best & Worst experience and the rate of the workshop.

highlighted this important.” He then continues by adding that: “Also as an artist, I have been doing different projects. But, today the act of working in a collaborative space has taken me to a very interesting area which I wouldn’t have arrived by myself. With my group we have now basically 5 interesting ideas to develop further.”

Elisa, shared her thought by adding: “So, we started with the persona, and we created bonds with our persona (pekka). We developed him in such an interesting way that he helped us decide which idea to chose.”

Aliakbar wants to know the reason we asked them to make a persona. Mathijs replies to him: “Persona as a tool helps you design different perspectives.” He then continues by adding: “Persona mapping should have been in the beginning of the workshop so you would know who you are designing for.” Mathijs continues: “since we realised all the groups are engaged with their group work and busy generating ideas, we decided not to interrupt and provide the persona template sheet later”. After this comment of Mathijs, Elisa, raises her point of view by adding that the structure of this workshop worked really well for her.

Regis, wants to know how this workshop fits into my thesis? My answer is that: “I have studied this area for the past few months. I realised the potential and impact that this research could add to the scene, rather than just executing my own application.

I then continue adding: “Meanwhile there have been a rise of mobile soundwalk applications, but mostly tend to be lacking the experience part.” Which Camilo disagrees. He talks about the artistic point of view and underlines: “there has been a lot of work in the area of soundwalk and soundscape. Perhaps, in the commercial or business point of view there has not been that much of work, or not meaningful enough.” Now, Mathijs disagrees with Camilo by adding that: “Artistic projects are not mainly accessible to everyone and nor can everyone collaborate by submitting their contents. Specially, as we talk about crowdsourcing. I also think “sound” itself and “walk” as an experience together are in some aspect even richer than images.” Regis catches up with his question by adding that this it is more interesting to research on then just to make an application. He then continues: “I like that you are trying to explore the area better and not so much to come up with something too fast, like presenting an application. I would suggest to all Media Lab students to be more critical in general instead of just proposing something. I feel the tendency of people willing to just create something.”

Akbar shares his point of view. He compliments what Regis said and adds to it by: “Too many things are being created without being properly thought and that causes its own pollution.”

Mathijs makes a conclusion by stating: “I think what Pouyan is trying to do is to create a foundation in order to help others create something meaningful and useful. He is doing something which is disruptive.”

Aliakbar also makes a conclusion by saying: “I think if Pouyan continues his research in a significant duration of time, he will become the definitive voice of talking about this genre. Therefore, it is important to raise the public awareness on this genre. As an artist, I have come across soundscape and soundwalk recently. Even though I have been working with it but not really known what it is and what it implies. So, if it would have existed, I would have had a better understanding of what it is all about. So, perhaps your work will enable people in the future to understand it better and for me that is what is brilliant.”

Regis has another question, he wants to know about the cultural view point which I had mentioned before. He thinks that one strong part in sharing cultures is the idea of empathy, to understand someone else even though the person is from a different culture. “Right?” he asked.

“With storytelling you actually get to the cultural aspect” says Camilo. He then continues: “If you have the recorded sound and narrative together you can recreate what has been happening in your social environment and share that with other people. Mathijs adds that: “Story enables a cultural sharing and without a story we disable a cultural sharing.” And Leda continues: “Otherwise you will only experience the sounds through your own culture.” So as a conclusion Akbar emphasises that: “Don’t think about culture, then it will become cultural tourism application.” Aliakbar builds on this conclusion by saying: “The idea should be in a way that the service does not portray the sense of multiculturalism.” “Yes”, Regis adds and continues: “This is why I mentioned the cultural aspect. Because the idea of empathy is more powerful than the idea of multiculturalism. Therefore, you have the empathy with someone else regardless of their culture.”

Camilo suggests that the stories don’t necessarily need to be with sound. It can be a voice, text or image. But, if the voice is being used to narrate a story it is important to find the right voice.

Mustafa, joins the discussion by adding that there is a time element to sound which could confuse the listener. For instance, a sound at night is completely

different from a sound in the morning from the same exact locations. So, that will give the user two completely different perspectives. Moreover, timestamp can give the user a perspective, but it can still be confusing.

Leda shares her thoughts by adding: “A city in general has many different perceptions itself. So, there is not one perception of a city either. Therefore, a city has many different sounds as there are many different aspects to a city. Meaning that you can not build one sample and say this is the city.”

Akbar, concludes: “This is why in design we have objective of design. As a designer you should have your objective clear. So you know how you want to show and what you want to show.”

5. ANALYSIS & FINDINGS

This chapter presents my analysis and findings. After my interview with Foundsounds, Echoes, Podwalk and Recho, I installed their applications on my device and used their products for a duration of two weeks. This enabled me to better understand and experience their service. In addition, during the creative workshop all the 9 participants took part in a user test that I had conducted to test all the four application. Thus, based on the collected data from my 2 weeks, using the applications and the test users from the workshop I have outlined the results in bullet points. Moreover, have also applied Norman's (1988) six design principles and Nielsen's (1995) ten usability heuristics for user interface design, to provide a visual analysis in this chapter.

Furthermore, the findings from: (1) Metrobeat (personal project), (2) Interviews with David (Foundsounds), Joshua (Echoes), Asmund (Podwalk and Recho), (3) Task scenario exercise survey results, (4) Paper-prototype user test results, and (5) Creative workshop outcomes. In addition, from the analysis in this chapter are presented based on their initial activities by bullet points in this chapter as well.

5.1 ANALYSIS

Based on the collected data from my 2 weeks, using the applications and the test users from the workshop I have outlined the results in bullet points.

5.1.1. FOUNDSOUNDS

I should mention, based on the interview with David, he has pointed out that Foundsounds is neither his nor Jeff's (co-designer) full time work.

The application delivery fails in these criteria:

- It is not clear why a user can play several sounds at once?
- Buttons are too small.
- When a user has recorded a sound there is neither a back button nor guidance to show a way back or cancel a sound submission.
- Feedback of "play" button is very poor. Meaning when a user presses the play button they have to wait for couple of seconds before any feedback is given from the system.
- It is not clear, why the recording feature as a core has secondary priority.

- The users are not able to edit their sound submission image. Meaning they are limited as the system crops the image automatically without providing any options.
- The system crashes many times.
- It is not clear where to find the recorded sound after saving it.
- There is no help or documentation for submitting a sound.
- The user can not edit a sound submission. Meaning they can not add a comment nor an image after submitting it.
- System crashed again.
- The user interface design makes a user confused with what to do and how to do it. Meaning that it represents “Instagram” but, the functionality is different.
- It is not clear what the icons do unless user experiments.
- It is not clear why a like button adds a sound to “favorites”.
- It is not clear why a user should press a sound first and then press the “like” button.

In summary, even though the application has a beautiful user interface, but it is not efficient. The navigation leaves the user hanging or wondering where to go or how to return. The system constantly crashes and makes the user frustrated. The system does lack to communicate and several problems arise during the user experience. Therefore, based on data collected this application does not provide a positive, enjoyable experiences for its user. Figures 14 & 15 show the criteria could be applied in Norman’s and Nielsen’s design principles.

5.1.2. ECHOES

It is important to highlight prior to building Echoes, the team has had experience by building “Sonicmaps”. Moreover, as mentioned in the interview, Joshua has dedicated his whole past year to Echoes.

The application delivery fails in these criteria:

- User must first download a sound in order to hear it for the first time.
- System frequently crashes.
- User is confused with the “Back” and “Info” as they are visually looking similar.
- It is not clear why a download fails.
- It is not clear why a sound can not be played.
- It is not clear why even after being asked to plug in earphones, no sound can be played.

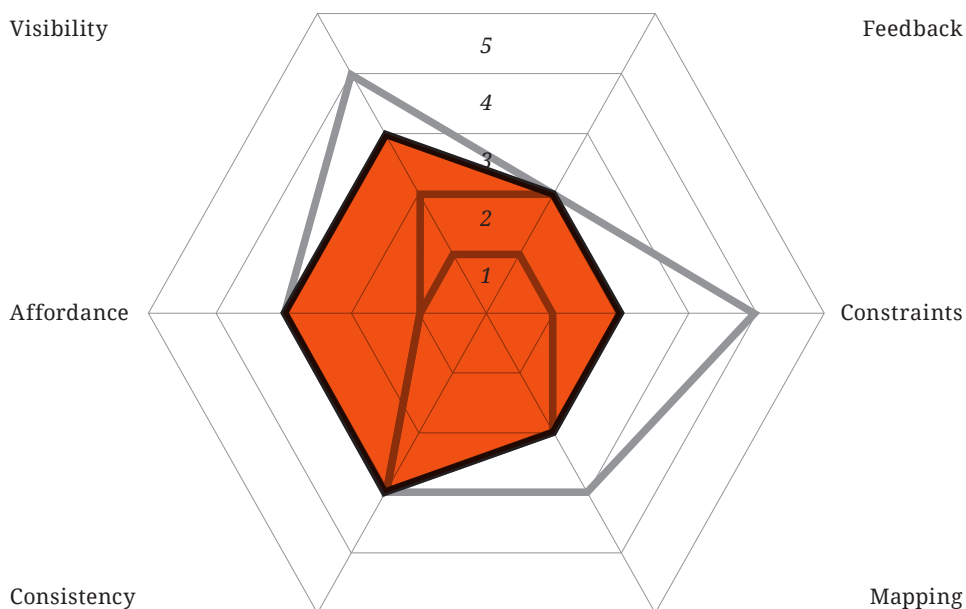


Figure 14. Foundsounds criteria applied on Norman's principles.

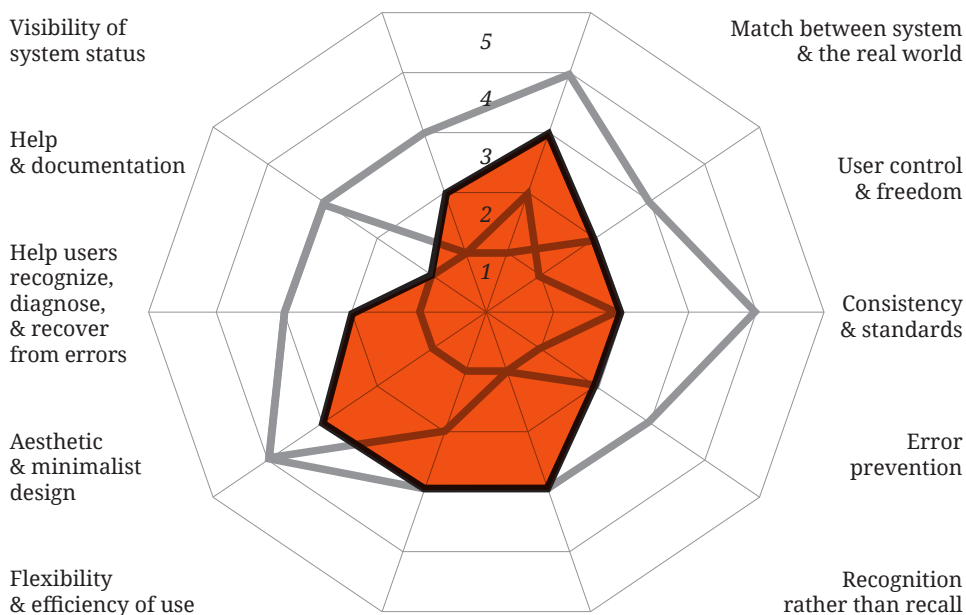


Figure 15. Foundsounds criteria applied on Nielsen principles.

Legend: 5 = Agree, 4 = Partly agree, 3 = Neutral, 2 = Partly disagree, 1 = Disagree

- There are two different version for “back” button.
- There are two different version for “info” button.
- The “Search” feature does not work.
- System crashes again and again.
- Don’t know what to do next
- Don’t know how to use this application

In summary none of the users were able to complete a task. Users left the application without being able to play a sound, record a sound, or experience any features or even learn how to use this application. Figures 16 & 17 show the criteria could be applied in Norman’s and Nielsen’s design principles.

5.1.3. PODWALK

This application was built in 6 months. Before, building this application the company has had gained experience from their first product, Recho.

The application delivery fails in these criteria:

- The visual interface is confusing in the beginning.
- There is not a clear visual interface design for the navigation button.
- I was linked to another website when using the navigation feature.
- The first time using the application, after being directed to a webpage it was not clear how to get back to the application.
- It is not clear, why I have not been provided with options to choose my language. I dealt with content in a language other than English.
- I can’t create content. I don’t know where to go and what to do.
- I am directed to their website in order to create content.
- It is not clear why “how to create content” is included in the setting page.
- It is not clear what is “notify” as a feature. Is it obscure?
- When user presses preview there is no visual notification or timeline.
- Don’t know how to stop or pause the preview.
- There is no fast forward, and don’t know how long a preview could last.
- Long delay before playing a preview.
- It is not clear why a user must download a podwalk in order to listen.
- Too many steps needs to be taken in order to hear a podwalk.
- The user hears a voice but without any soundscapes.

In summary, compared to its competitors, Podwalk provides a better user experience. Moreover, the visual interface design is elegant but not efficient. The

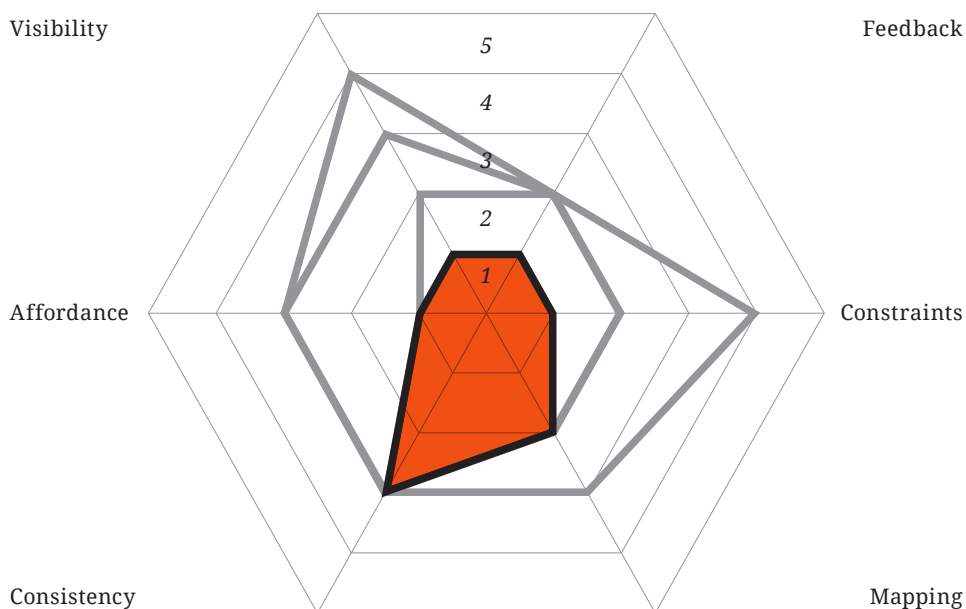


Figure 16. Echoes criteria applied on Norman's principles.

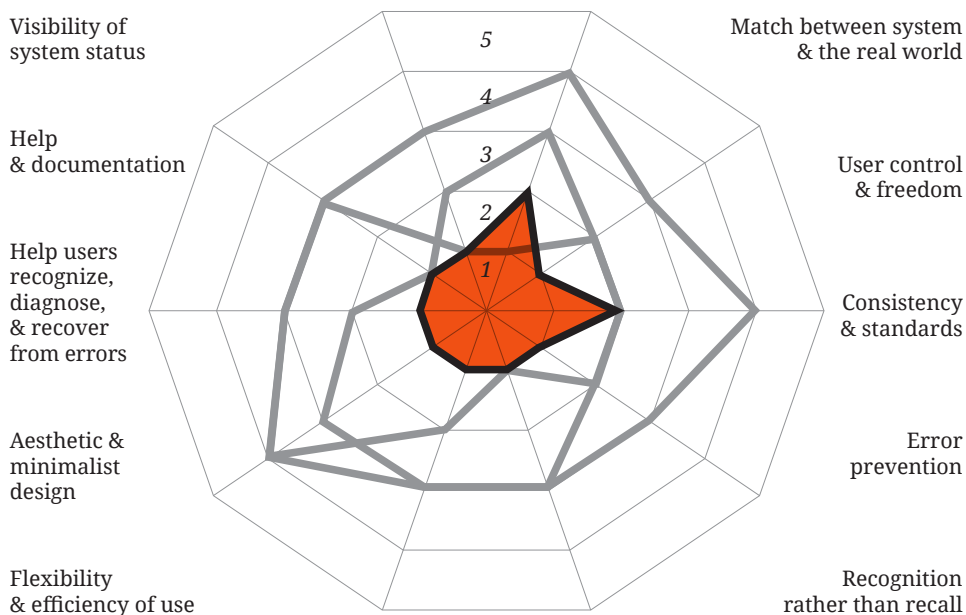


Figure 17. Echoes criteria applied on Nielsen principles.

Legend: 5 = Agree, 4 = Partly agree, 3 = Neutral, 2 = Partly disagree, 1 = Disagree

application navigation between feature sets are not clean as the user wonders where to go and how to return. Most importantly, there is no soundscape from the site for users to experience. Figures 18 & 19 show the criteria could be applied in Norman's and Nielsen's design principles.

5.1.4. RECHO

An award winning concept which was then built. Recho is the first application from Recho ApS, and Podwalk is there second work.

The application delivery fails in these criteria:

- There is no visual feedback to know if a recorded sound is being played or not.
- It is limited to only 30 seconds of recording.
- The user must keep holding a button during recording.
- To select a sound category the user must swipe. It is not clear which direction to swipe? (right or left)
- The share button can not be clearly identified as the share button.
- There is no back button. User must tap on the background to go back.
- While sound is playing there is no timeline or visual feedback.
- It is not clear how long a sound is.
- The sound keeps on repeating in a loop.
- There is not a stop button.
- The adding friends system is unclear (e.g. it was unclear whether I had to search for friends or none of them were using this application).
- A unique User Interface (UI) design but unclear.
- It is not clear how to toggle between: friends, curated and all.
- It is not clear, what is the application logo doing in the background. Until you press it.
- Help is in the option menu, user must explore to find it.
- The close button feedback has two different version.

In summary, Recho has a very unique interface which it seems easy to adopt and learn. But, after users start using the application there were several issues. Moreover, Recho has a an elegant interface design but it is not efficient. The navigation is not easy to learn and the recording button is not clear. Figures 20 & 21 show the criteria could be applied in Norman's design principles and Nielsen's usability heuristics for user interface design.

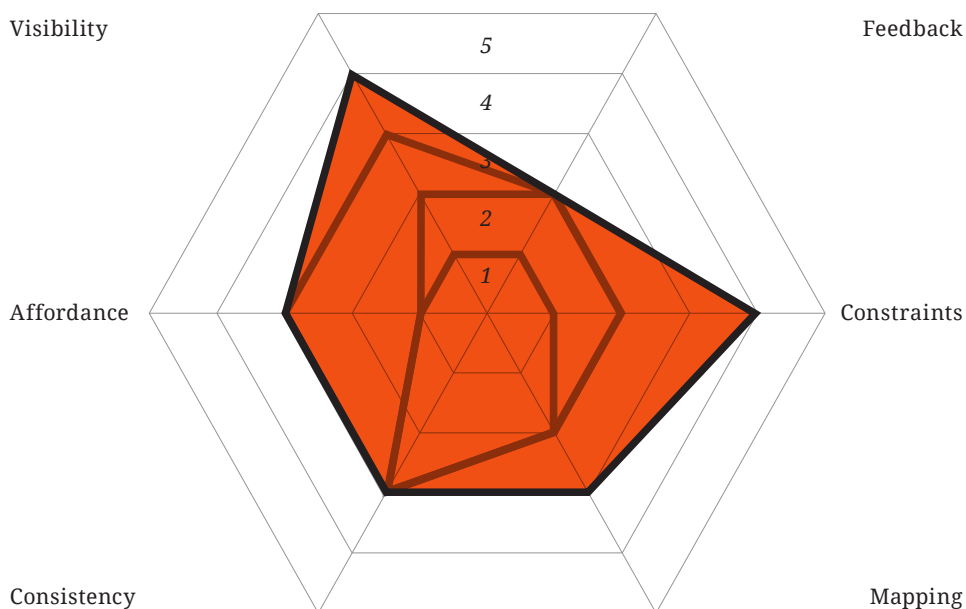


Figure 18. Podwalk criteria applied on Norman's principles.

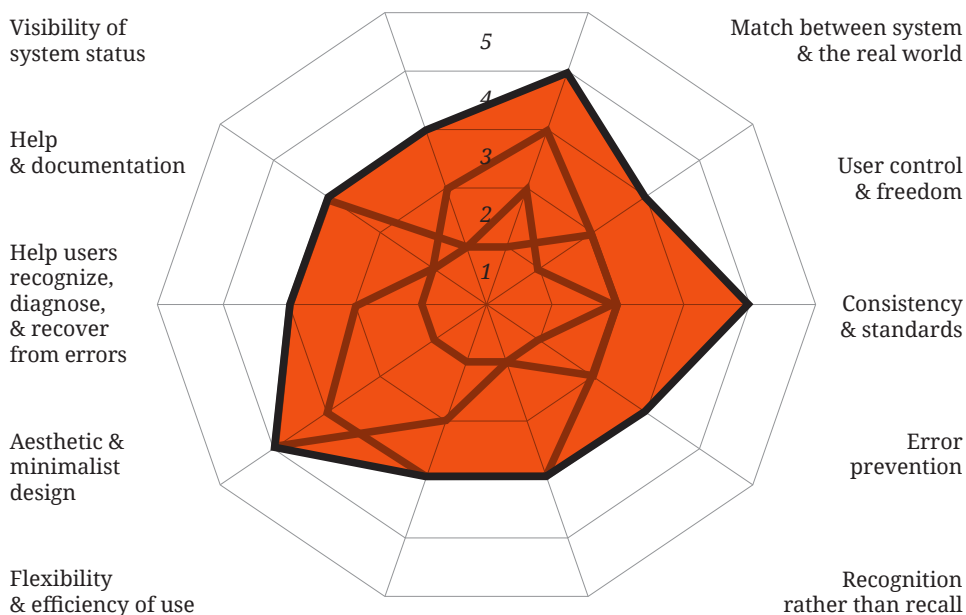


Figure 19. Podwalk criteria applied on Nielsen principles.

Legend: 5 = Agree, 4 = Partly agree, 3 = Neutral, 2 = Partly disagree, 1 = Disagree

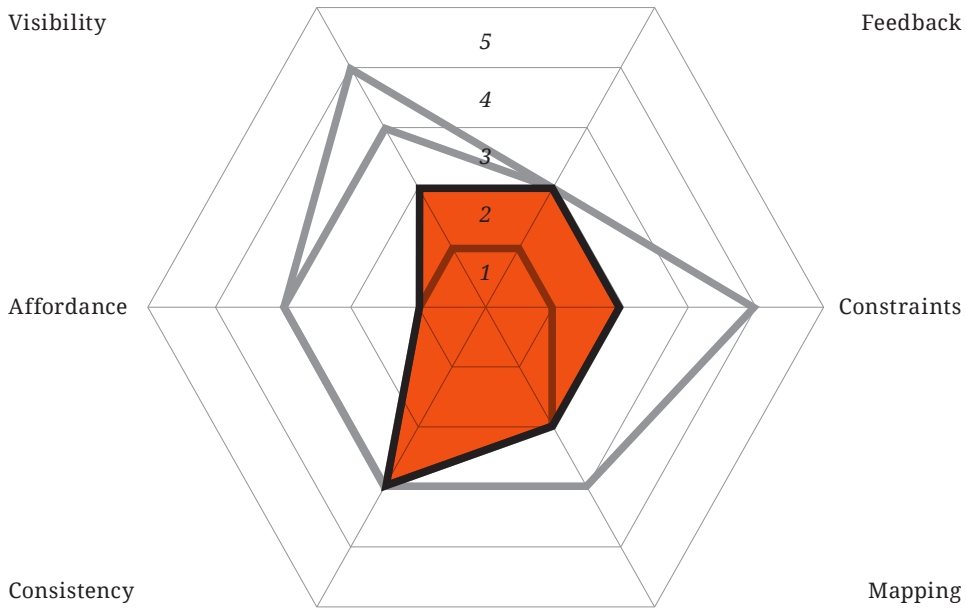


Figure 20. Recho criteria applied on Norman's principles.

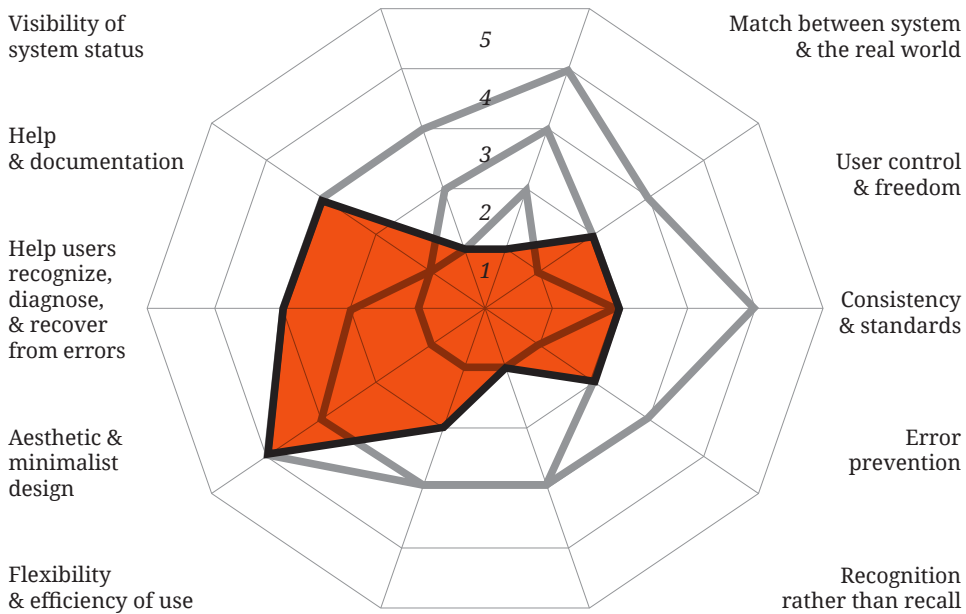


Figure 21. Recho criteria applied on Nielsen principles.

Legend: 5 = Agree, 4 = Partly agree, 3 = Neutral, 2 = Partly disagree, 1 = Disagree

5.2. FINDINGS

These are the findings from: (1) Metrobeat (personal project) (2) Interviews with David (Foundsounds), Joshua (Echoes), and Asmund (Podwalk and Recho) (3) Task scenario exercise survey results (4) Paper-prototype user test results, and (5) Creative workshop outcomes. In addition, from the analysis of my 2 week user test and the creative workshop user tests results, it all enabled me to highlight the following findings. I will present these findings in relation to their initial activities by bullet points. All the highlighted findings enabled me to outline the design principles presented in the next chapter.

5.2.1. PERSONAL PROJECTS (METROBEAT)

- Make it accessible.
- Design an ecosystem.
- Provide constant feedback.

5.2.2. SOUNDWALK APPLICATIONS (INTERVIEWS)

- Constantly keep on developing and improving.
- Being open to change.
- Learn and reflect from your previous experiences to avoid making the same mistake again.
- Analytical design is a better approach than just doing.
- Being concerned about the user experience.
- Building communities.
- The value of scalability.
- Quality of content (quantity vs quality)
- Create vitamins and avoid pain killers.
- Create a unique and reproducible experience.
- Capture a closed entity.
- It is too demanding to expect users to create content.

5.2.3. TASK SCENARIO EXERCISE

- Keep it simple.
- Provide clear instruction.
- Educate user through the system about soundscape and soundwalk.

5.2.4. PAPER-PROTOTYPE USER TESTS

- Use a universal terminology (follow real world conventions).

- First things first, educate the user about soundscape and soundwalk.
- The system should always keep users informed of their current status.
- What user sees must perceive intuitively.
- Be consistent all the time. The same action should call the same reaction.

5.2.5. CREATIVE WORKSHOP OUTCOMES

- Storytelling connects people together.
- Make users fall in love at the first sight with the application.
- Collaboration and co-design takes you to very interesting areas which you wouldn't arrive by yourself.
- Raise public awareness.
- Story enables a cultural sharing and without a story we disable a cultural sharing.
- Storytelling enables you to show empathy with others.
- The time is a very important element in soundscape and soundwalk.
- There is no one perceptions of a city. A city has many different sounds as there are many different aspects to a city.
- Have a clear design objective.
- Generate stories using soundwalks.
- Snippets of stories are recorded in collaboration to create a full story known as a clip.
- Bring in the basic interaction.
- Provide users with different options for communication.

5.2.6. RESULTS

Here are the findings from the analysis of my 2 week user test of all the four applications and the creative workshop user tests results.

- Constant feedback. Within reasonable time users must receive updates of current status.
- Same actions should not have different reactions.
- Accurate relationships between the controllers and their effect should be built.
- Graphical user interfaces should purvey clear visual attribute of a controller to the users. Moreover, how users perceive affordances of a controller should be designed accordingly.
- When users choose a function by mistake, they need to be provided with simple and clear instructions to leave the unwanted state.

- Instructions should be retrievable whenever user needs.
- Based on the experience level of users, system should be prepared to provide relevant and frequent actions.
- System should provide users with constructive suggestions when errors occur.
- Help should be provided and accessible for users at any point.

6. DESIGN PRINCIPLES

The personal project (metrobeat), interviews, task scenario exercise, paper-prototype user tests, creative workshop, and the analysis of my 2 week user test along with the creative workshop user tests, show many key findings. In this chapter are guiding design principles for mobile soundwalk sharing applications for public space in cities. The aim of the presented principles are to help improve the design of mobile soundwalk applications in order to engage users and provide a rich and memorable user experience throughout their interaction with the service.

But, before this important, Nielsen defines the key usability concepts as: “Usability is a quality attribute that assesses how easy user interfaces are to be used. The word “usability” also refers to methods for improving ease-of-use during the design process.” Learnability, Efficiency, Memorability, Errors, and Satisfaction are five quality components of usability. Another key component is utility among others, which is to check “whether it does what the user needs?” (Nielsen, 2012).

In addition, Norman discusses three aspects to mental models: (1) Design model (2) User's model, and (3) System image. As a designer, our role is to make sure the system image is consistent with and operates accordingly to the proper conceptual model (Norman, 1988). Therefore, based on all the findings from all the activities made through this thesis, 12 design principles which are outlined in bullet points below are: (1) Test, Test & Test Again! (2) Educate Users - Onboarding Should Be Easy (3) First Impression - Love At The First Sight (4) Design Universal (5) Be Consistent - Navigation Should Be Easy (6) Gestures - Don't Be Invisible, Make It Visible (7) All Day - All Night (online - offline) (8) Communicate With Users At All Time (9) Create Value By Rewarding (10) Save Me Time Wherever You Can (11) Multiple Device Ecosystem (12) Be Smart & Be Faceless.

6.1. TEST, TEST & TEST AGAIN!

- Conduct user tests from the very beginning of the design process (quantitative and qualitative) to use collected data to determine what the content(s) users need are and where they can access them.

Note 1: The competition is always a click away. So, if a user starts wondering: Where am I? and is not able to figure out where to start and what to do. (e.g. they get confused with the words and terminologies). The designer should reconsider the choices and improve the system before the user leaves the service.

Note 2: Ensure that fundamental features and content are optimized for mobile.

6.2. EDUCATE USERS - ONBOARDING SHOULD BE EASY

- Ignite users about soundscape and soundwalk. Be precise and short.

Note 1: Omit needless words - Vigorous writing is concise. A sentence should contain no unnecessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts (Strunk & White, 1979).

6.3. FIRST IMPRESSION - LOVE AT THE FIRST SIGHT

- First launch is a make or break situation. If a new user gets confused or frustrated while trying to acquaint themselves with your application, they'll ditch it ASAP. If your application provides complex functionality, you might want to include a 'tips and tricks' overlay, or perhaps a few panels of orientation screens. Note that this is not a substitute for a good design; if you find yourself creating a lot of help texts, it could indicate that your UI needs work.
- With first launch of the application, orient users by presenting a quick introduction and short tutorial on how to use the application. Not to forget users need to be provided with options to either skip or view later.
- If users can't find what they are looking for, they will leave. Search, Help and support options need to be user friendly and accessible at all time.

Note 1: When first launching a feature, or a new functionality, tips and walkthrough tutorial enables users to complete relevant tasks.

- Instructions should be either eliminated or bare with minimum. As everything should be looking self-explanatory.

6.4. DESIGN UNIVERSAL

- Think about how quickly and easily the graphical user interface design conveys information. So, even average users know what it is and how to use it. In addition, when a user looks at a screen it should be self-evident and/or self-explanatory (Krug, 2005).

Note 1: When users change device orientation, sustain users location on a page.

Note 2: When users are interrupted with daily life occurrences, assure their current status and/or location on a page to be remained untouched and saved.

Note 3: Small details (e.g. descriptive labels for navigation items) should always

require the designer's attention. Small details will be noticed and appreciated.

Note 4: As we are talking about touchscreen consider the thumbs and or index finger and parts that come into contact.

Note 5: Enhance users experience when input data is required with: (1) Auto-correction (2) Auto-capitalisation (3) Auto-complete.

Note 6: Enable flexibility for users in different environments: (1) Bored, on the couch at home (2) Busy, rushing through pedestrian signals to catch their bus (3) Lost, in unfamiliar surroundings, or getting lost to find unknown places.

6.5. BE CONSISTENT - NAVIGATION SHOULD BE EASY

- Choose and/or design the most sense making navigation model (i.e. tab bar, hamburger, drill down). Mobile navigation must be discoverable, accessible, and take little screen space (Nielsen, 2015).
- Create paths (visual flow) from users starting point to completing a task point. Additionally, always provide help for users to know where they are and how to get home.

Note 1: There is no time to read any more than necessary.

- Limiting the number of clicks, users need to make in order to complete a task. Bare in mind that each click should be evident and in-lined toward this important.
- Apply self-evident scrolling elements to enhance the user's' need. Not to mention a non-scrolling screen is more predictable.

Note 1: Provide an indicator for users to find invisible content (e.g. animating in reverse scrollable content of a screen getting back into its default position).

Note 2: Beside one long scrolling screen of information there are 2 other options: (1) Split the info into appropriate chunks (Mini-IA), and (2) Blend together subtopics of many topics (Distributed information) (Nielsen, 2011).

- Address the navigation needs of both touchscreen and non-touchscreen users.

6.6. GESTURES - DON'T BE INVISIBLE, MAKE IT VISIBLE

- When applying a gesture to your service, reveal their existences to users by providing a quick tryout.
- Multi-touch gestures like zoom-in or zoom-out requires both hands. Provide users with options to avoid disengagement. In this, case buttons can be one option.

6.7. ALL DAY - ALL NIGHT (ONLINE - OFFLINE)

- Digital devices are meant to be used at anytime, anywhere. We are now online, but in the next few minutes as we change to a different environment, we go offline. The system should provide users with relevant contents based on their location at all times.

6.8. COMMUNICATE WITH USERS AT ALL TIME

- The system should always keep users informed by sending back information about what action has been done and what has been accomplished to ensure they know what to do next in their tasks and/or continue the activity. This important must be done within a reasonable time (Nielsen, 1995).

Note 1: There are two types of feedbacks: (1) Activational feedback which indicates that control was activated successfully and (2) Behavioral feedback which indicates that the activation or adjustment of the control has now had some effect on the system (Matz, 2012).

Note 2: To deliver meaningful feedbacks: (1) Actions need reactions (2) Give good feedback and (3) give good error messages (Natoli, 2014).

Note 3: Confirmations are less intrusive than alerts because they are in response to a user action and therefore in context and perhaps even expected (Creativeblog, 2012).

- According to a study by Truste (2013), privacy and security are the top two concerns among smartphone users, therefore: (1) Explicit permission needs to be guaranteed before collecting users' personal information from their devices. (2) Provide users with full control over sharing their personal data (e.g. location data). (3) Privacy and security policies should be clearly and contextually presented to users.

Note 1: Users should be provided with options to receive these information via email and they should also be accessible in a secondary section of the application.

6.9. CREATE VALUE BY REWARDING

- To invite users to generate content, as an exchange they should be provided with rewards. Facilitate a platform for users to: (1) Share their content with others to co-create content (2) Sell their content (3) Distribute across various platforms and third-party services, while still retaining their right (4) "Tsu" reward system for content creator (Socialtimes, 2015).

6.10. SAVE ME TIME WHEREVER YOU CAN

- Provide an intuitive user experience by reducing the learning curves. This important occurs when a system follows conventions and patterns. “They are very useful. As a rule, conventions only become conventions if they work. Well-applied conventions make it easier for users to go from site to site without expending a lot of effort figuring out how things work.” (Krug, 2005).
- Getting rid of all those words that no one is going to read has several beneficial effects: (1) It reduces the noise level of the page and (2) It makes the useful content more prominent.

6.11. MULTIPLE DEVICE ECOSYSTEM

- Users who sign in should see their personalized settings, irrespective of the device or channel being used. Therefore, provide key capabilities across all channels.
- Leverage information that the user has provided, and respect their preferences and settings.

6.12. BE SMART & BE FACELESS

- Faceless interaction is a potential interaction that takes advantage from our chaotic daily life. It collects metadata from our daily activities to create generative stories.

Note 1: Potentially, it can also notify the users when it is near an important or historical site.

7. CONCLUSION

When I started my studies my goal was to graduate within two years. After diving into my thesis, an area which I had no experience, it required an additional year to complete this research. Also, during this time, I have worked for two different companies as a designer, and this has helped me see the bigger picture, cater user's need by empathy design and choose the most suitable method(s) to build delightful digital services. In this chapter I have summaries my research, presented my conclusion and future directions.

This thesis was confined to contribute to soundwalk and soundscape communities by presenting a set of design principles for mobile soundwalk experiences. With a dream for people, better perceiving their environment which would inevitably lead to a better understanding of one another around the globe.

In early stages of this thesis, the intention was to design and develop an application. After deeper explorations and based on the findings, it became clear that most existing applications are not delivering users minimum expectations. Thus, it changed this thesis direction to improving mobile soundwalk applications for public space in cities. Which I believe, will bring its impact and hopefully opens doors for further research and development.

Within the defined scope I have conducted a task scenario exercise, interviews, user tests, and a creative workshop in a participatory approach. The significance of this research has been to present a set of validated design principles for mobile soundwalk sharing applications. It is important to mention that this thesis has already made an impact on the people who have participated in the field exercise, paper-prototype user tests and the creative workshop. Hopefully, as a result of this thesis people would listen a bit closer and slow down while walking through places to better perceive their environment.

Collected data were based on respondent's honesty and sincerity which could have affected the accuracy of this thesis. Also, the subjective interpretation of the collected empirical data by the researcher possibly has influenced the findings and may have resulted in an inaccurate insights. On the other hand, if this thesis would have been done in a collaborative team it could have made differences.

Due to time constraint, this thesis was only concentrated on how to improve mobile soundwalk applications for public space in cities. Hence, a set of design

principle were presented. Developing an application itself was not part of this research. Perhaps this thesis could be a starting point to onboard others to help build a delightful digital product.

“In the long history of humankind (and animal kind, too) those who learned to collaborate and improve most effectively have prevailed.” This famous quote by Charles Darwin, expresses perfectly how I have come to understand the importance of participatory design to improve the scene of design for mobile user experiences.

As I write this conclusion, I believe mobile user experience is still an ongoing field where improvements are to foster and emerge.

In order to deliver a better user experience, I realised a potential need to design elements for user interaction with digital products is needed. Thus, this thesis has delivered these key elements to help create a great mobile user experience. I believe this thesis helps designers deliver a delightful user experience.

A key advantage of this conceptual user experience model over other models is its participatory approach which has prioritised for site-specific mobile applications in a holistic manner. Moreover, as long as improvements continue to emerge, mobile user experience should be considered a developing field.

7.1. FUTURE DIRECTIONS

I feel very confident with today's experience and knowledge to release the results for the competitive industry and to further develop my first version of mobile soundwalk sharing application.

My next challenge would be to continue the research from a mobile device to multi-device experiences. And also, during this invested time of researching, I have found myself very much interested in the topic and would like to continue my studies in the level of doctoral, where I would challenge myself to take action by researching, experimenting, launching, and iterating, as well as being engaged in more global collaborative discussions and initiatives.

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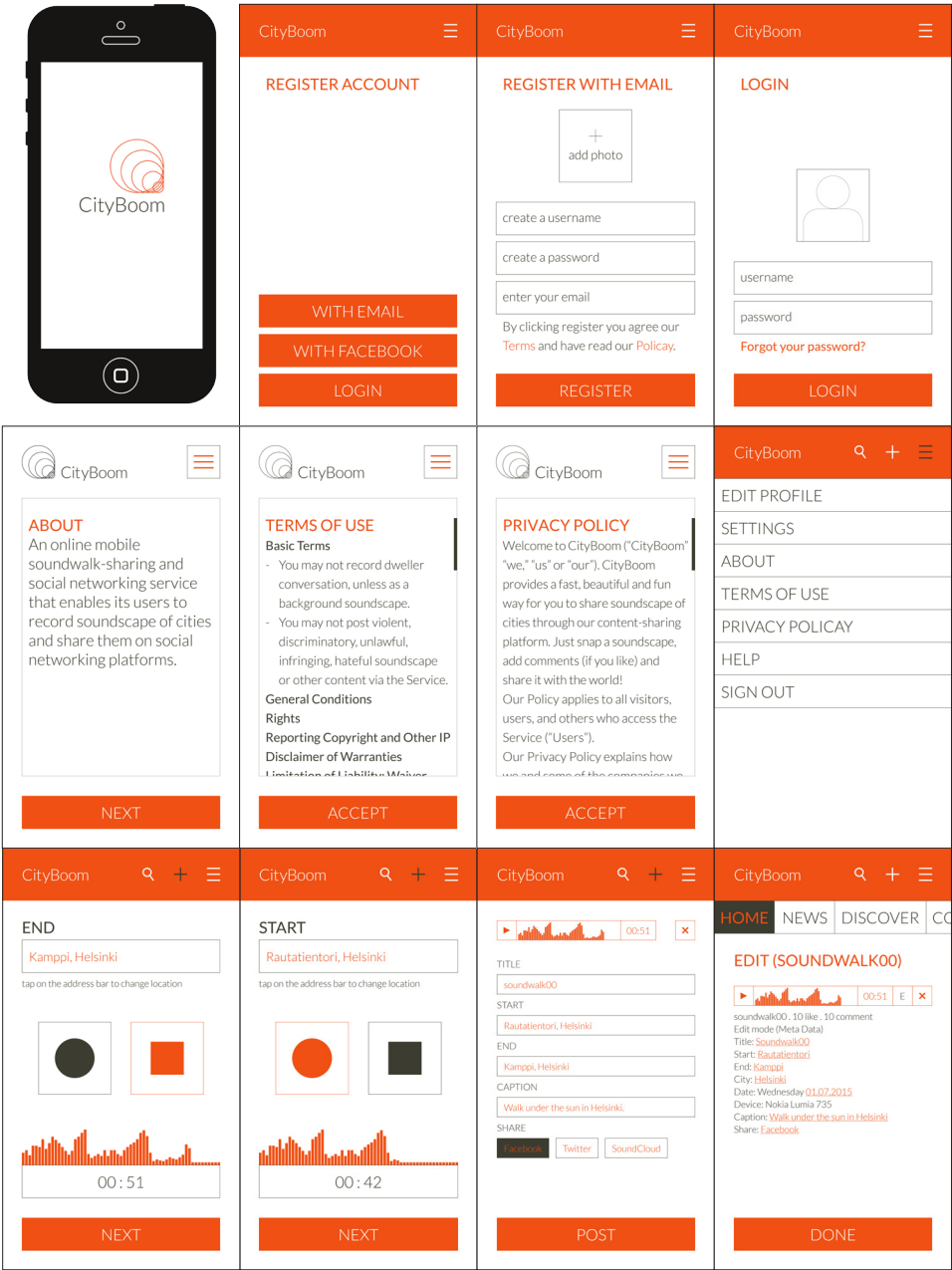
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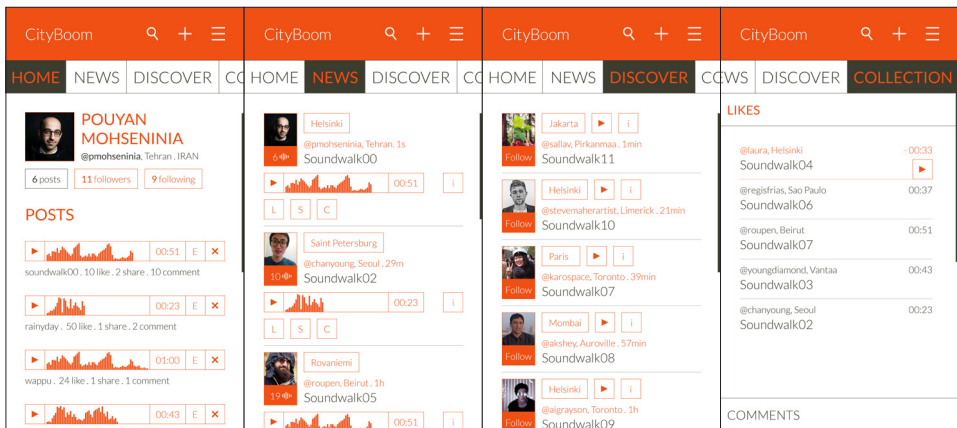
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APPENDIX

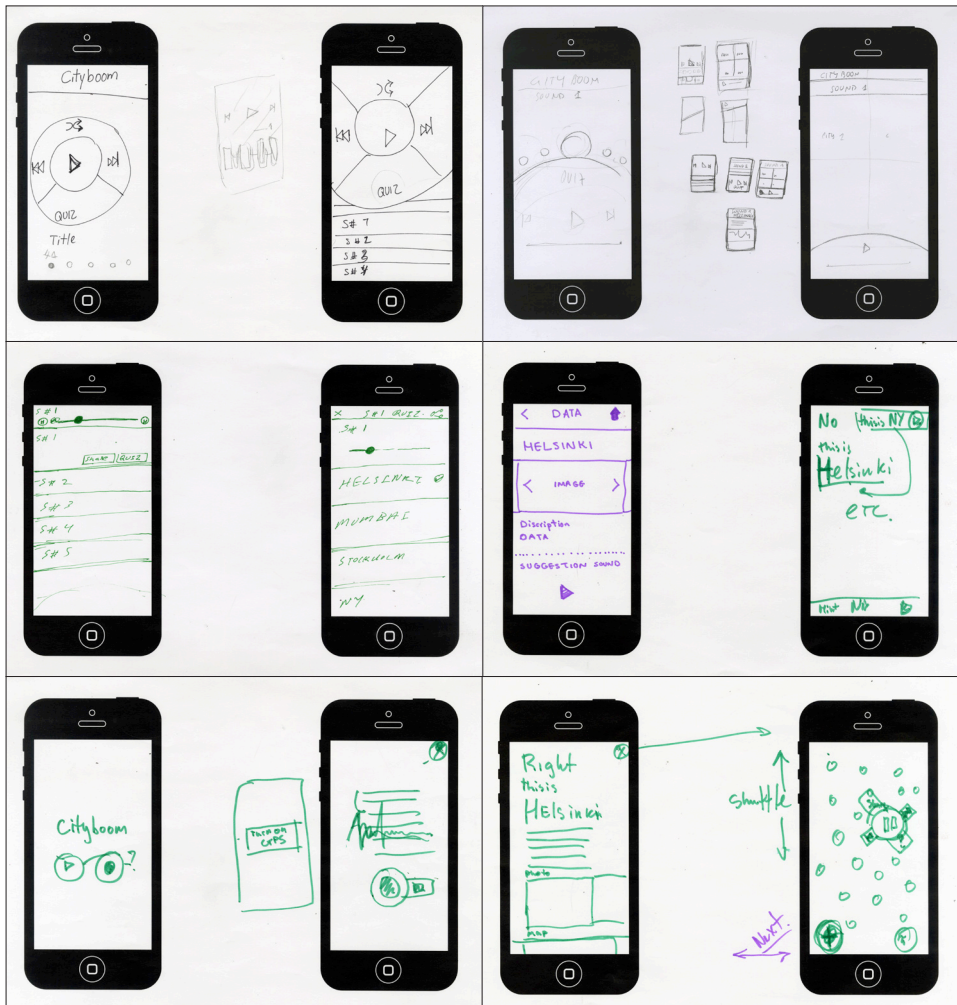
APPENDIX I. CITYBOOM WIREFRAMES & PAPER-PROTOTYPING DOCUMENTATION

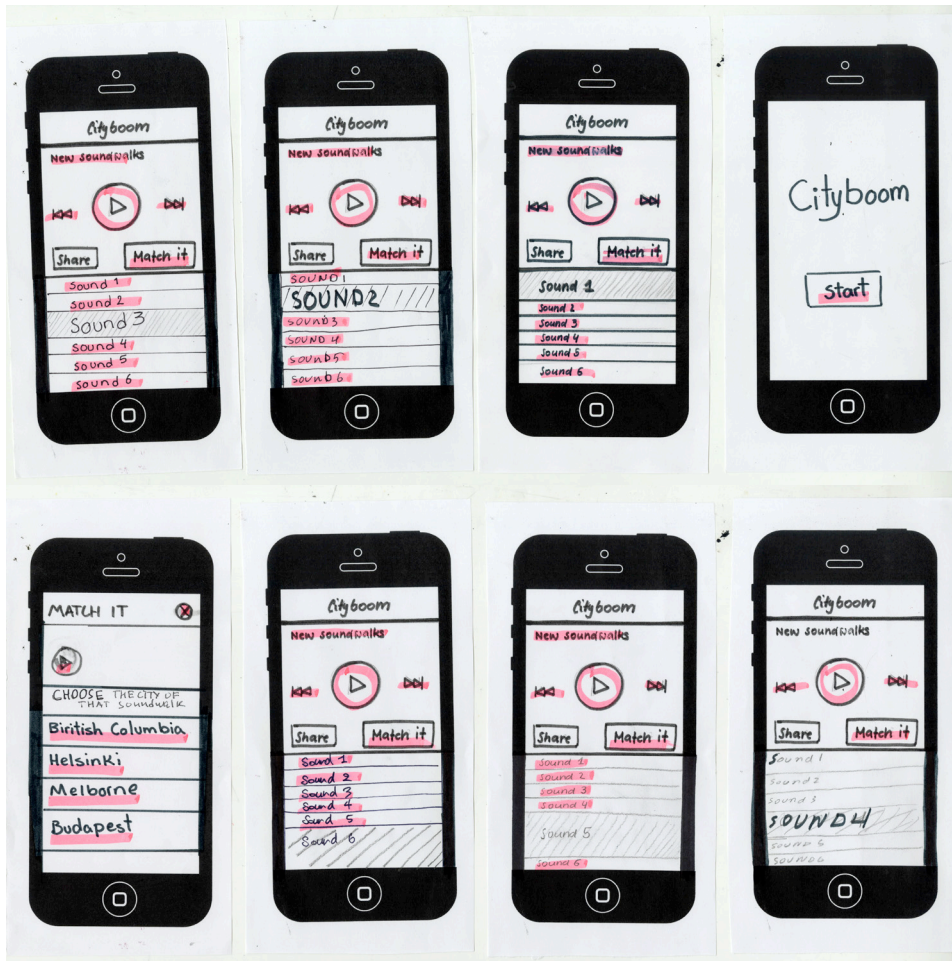
1. CITYBOOM





2. PAPER-PROTOTYPING DOCUMENTATION





The final set of interfaces which were used for the user tests.



	disagree	partly disagree	neutral	partly agree	agree
The app was easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
It was easy to learn how to use the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If I wanted to do something, it was clear how to do that	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The system had all the functions I expected	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It was easy to navigate to any system state I wanted to go to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
It was easy to find ways to complete the task	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The game was interesting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
How many times would you play it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the system	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am interested with the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I would install an application like that on my phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Before the test

Greet the user: Ask for the user's name and age Min Han

Ask which kind of a phone user uses every day iphone

Are you ok with us filming? no video Are you ok with us publishing your name in results publishing? Are you ok with us publishing the video?

Tell about thinking aloud. Thinking aloud example.

During the test

Remind of thinking aloud. Read the task aloud and give the task paper to the user.

After test

ask for comments on evaluation

How would you characterize the system?

virtual experience
not alternative tour

What was the best about the system

hear the sound with
asimple click

What was the worst about the system

uploading
new set of sound
limited sounds

What would you add to the system

frame for uploading.
supporting format. multi format!
wave form option on bg.
in map pinned to it
choose the quality of sounds.
search option

Are you interested in soundwalks

alot

In what kind of context or environment you would listen to them

when you want to travel
library - different location
quite place

What kind of information yo would like to have additionally to the soundwalks

distance - location of it
language of country
*
cooler to upload my own sound
visuals & clues.

First paper-prototyping user tester. Which as a result party agreed with the whole system design, and characterised this application as a virtual experience.

	disagree	partly disagree	neutral	partly agree	agree
The app was easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
It was easy to learn how to use the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If I wanted to do something, it was clear how to do that	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The system had all the functions I expected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
It was easy to navigate to any system state I wanted to go to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
It was easy to find ways to complete the task	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
The game was interesting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
How many times would you play it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I am interested with the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I would install an application like that on my phone (if I had a new phone)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Before the test

Greet the user. Ask for the user's name and age Camilo Esan - 22

Ask which kind of a phone user uses every day iPhone 4

Are you ok with us filming? yes Are you ok with us publishing your name in results publishing? yes Are you ok with us publishing the video? student in sand named

Tell about thinking aloud. Thinking aloud example.

During the test

Remind of thinking aloud. Read the task aloud and give the task paper to the user.

After test

ask for comments on evaluation

How would you characterize the system?
mix between game & ethno discovery
guessing ✓

What was the best about the system
match it (names can improve)
the design

What was the worst about the system

uploading
new set of sand
limited sounds

What would you add to the system

frame for uploading.
supporting format. multi format!
wave form option on bg.
inmap pinned to it
choose the quality of sounds.
search option

Are you interested in soundwalks

alot

In what kind of context or environment you would listen to them

1. bored
2. in the place / traveling

What kind of information yo would like to have additionally to the soundwalks

context data!
what was happening / story
who recorded the sound

Second paper-prototyping user tester. Which as result agreed with the whole system design, and characterised this application as a mix of game and ethnic diversity.

	disagree	partly disagree	neutral	partly agree	agree
The app was easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
It was easy to learn how to use the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If I wanted to do something, it was clear how to do that	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The system had all the functions I expected	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It was easy to navigate to any system state I wanted to go to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
It was easy to find ways to complete the task	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
The game was interesting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
How many times would you play it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I am interested with the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I would install an application like that on my phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Before the test
 Greet the user. Ask for the user's name and age. John Klimaki 22
 Ask which kind of a phone user uses every day. iPhone 5
 Are you ok with us filming? game designer Are you ok with us publishing your name in results publishing? Are you ok with

During the test
 Remind of thinking aloud. Read the task aloud and give the task paper to the user.

After test
 ask for comments on evaluation
 How would you characterize the system?
Small app inside another app
small toy
use for installation

What was the best about the system
experiencing sound of cities

What was the worst about the system
no clue what match it is
name of sound & title confusing
unclear matching system after incorrect answer

What would you add to the system
all video - match with the sound

Are you interested in soundwalks
not really

In what kind of context or environment you would listen to them
part of installation
give it a try

What kind of information you would like to have additionally to the soundwalks
google map
360 photo or video
* what is the main audience who knows soundwalk
add a couch surfing community

Third paper-prototyping user tester. Which party agreed with the who system design, and characterised this application as a small toy or an art installation.

	disagree	partly disagree	neutral	partly agree	agree
The app was easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
It was easy to learn how to use the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If I wanted to do something, it was clear how to do that	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
The system had all the functions I expected	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It was easy to navigate to any system state I wanted to go to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
It was easy to find ways to complete the task	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
The game was interesting	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How many times would you play it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I am interested with the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I would install an application like that on my phone	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Before the test *what is soundwalk*

Greet the user. Ask for the user's name and age *Adrian Reskin 24*

Ask which kind of a phone user uses every day *ip 6*

Are you ok with us filming? *yes* Are you ok with us publishing your name in results publishing? *yes* Are you ok with us publishing the video? *yes*

Tell about thinking aloud. Thinking aloud example. *had highlight, task / use the system for*

During the test

Remind of thinking aloud. Read the task aloud and give the task paper to the user.

After test

ask for comments on evaluation

How would you characterize the system?

*For 1. who are interests
I see download delete
fun to try
would like to deploy
introduce what a soundwalk is
provide open source*

What was the best about the system

*Subject
Easy to navigate*

What was the worst about the system

not able to go back

What would you add to the system

*could not publically
but with one friend*

Are you interested in soundwalks

might

In what kind of context or environment you would listen to them

*Relaxing not outside
collaboratively
soundwalk exchange with friend*

*soundwalk ref.
used as relax sound.*

What kind of information yo would like to have additionally to the soundwalks

*- where, who walks by
(like part.)
What is going on*

Third paper-prototyping user tester. Which party agreed with the who system design, and characterised this application as a fun experience.

APPENDIX II. INTERVIEWS

1. INTERVIEW WITH DAVID JENSENIUS:

What is the motivation for this project?

It is funny, the website actually presents the application as a start up application idea. Which it is the opposite of what my intention. My real goal is to collect emergent art project. Wherein I, and couple of colleagues will go out. Whenever we hear a cool sound which we like. Record it and listen to it. Since it is using geolocational tag, it makes the whole process of recording more convenient. I also wanted to see what would other non professionals bring, what are their interesting sounds and what will emerge from there. Outside of the individual sound component there are two main collage component which are constantly browsing the map and listen to sounds you like. You can also stare it with 5 different sound in a region at the same time and create a sound collage. Emergent collages are changing all the time as people are adding sounds. If you are in a environment and there is enough sound recorded you can go out and instead of geographic collage you get temporal collage. For example imagine you are walking down the street and you hear the sound of construction coming to your headphones, that is a historical sound because perhaps the building is either built or there is no longer a building since it was deconstructive. Almost, like an echo!

Like what currently is happening in your sound environment, for instance now we can here a car noise in the background as this interview is happening.

By the way what is the noise in your background right now, while reading this paragraph?

There is also a collage component to it and it happens when multiple recorded sounds are recorded in that environment. So as a key element, you hear present, but with a mix of past. Going back to the question I had two main motivations to approach: 1. artistic, and 2. Emergent. I wanted to hear what people will bring to it, and also have different listening experiences as well.

Are you planning to make a business plan from this artistic project?

The answer is not at the moment. I recently presented a special version of application as an art installation. Where the community I was doing the installation for contributed to build a sound collage and that is what I would love to do / experience again. But in the beginning of the project when I was creating I had a negative experience about it. Since I am living in Ontario and here we have a huge startup community and culture. I actually took the idea to a nonprofit startups to get thing started. But what they

gave me was the idea of gamifying it. They were against my goals. I just put it up and watch waiting what will happen in the future. That's how I meet the UI designer who made the application look pretty. There is only two of us and neither are doing this as a full time thing! So, it is a small thing!

What is your point of view on human to human interaction for communication using such applications?

In my application I believe there is no direct communication as one records a sound and the very next would like that sound they hear. You can also see your favorites sounds. But, you can not leave comments. Why? even though it was programmed in the back end but never brought up to screen since I wanted to keep it simple. I have unique a perspective as I have no idea who the person for instance in Florida is using this application. But what is fascinating me is the they got my vision. Thinking in the same lines and that is very interesting to me. I am also very curious to see this emergent of people all around the world and I would like to check their background and investigate what brought them to the application. So, as an in experience of human to human communication it sparks a lot of curiosity to see people with the same vision and not recording Justin Bieber concert. Also in the context of geographics what is Florida sounded yesterday in this pace and here is a karaoke bar sounded in Asia one

other day. But, I think it is hard to answer this question and I am not sure whether I gave the best answer or not?

The impact of this experience and how it influences cultures? Especially, the participate of the exercise?

I think that is a very interesting question. One of the first time I presented the application in a public setting was a UX conference. The talk went pretty well as people came up to me after the talk. They emphasise the importance of such exercise and the effort to listen more instead of just going through the environment. That is what I am hopeful about, and want people to take away from. A way to slow down and listen a bit closer. How does that sound, sound in these sound environments with other sounds and how all these thing interact together. Even things that might not be interesting or boring. Maybe, it would not be that interesting and perhaps boring to think in a traditional way listening to the traffic or rain. But, I hope people either using the application or learn from the application to listen and practice listening in a day to day exercise.

Do you think such exercises will help cultures to come closer and in some extend be able exchange between?

I think so. I think that has been the goal of music in general. Which has happened from 1950 with cage and even before that as well.

2. INTERVIEW WITH JOSHUA KOPECEK:

You come up with ideas, but you don't thinking of them being business ideas. After finishing my PhD I become a business leader.

Echoes is my first and only business which I have been working on it for nearly one year. The team has grown and the product has changed a lot. Even though I came up with the idea 2 years ago. Back in Hanoi, Vietnam, where I was living for some time. I was involved in creating an audio tool and I was amazed with the technology possibility. I was asked to do this audio tool which is connected all around the world. We took the concept audio locative tools and tried to expand it. We applied for funding the next year and we made another Hanoi soundwalk where people really loved it.

So we started working on adding people to platform so that they can create and add their own content. But, it took a long time to figure out what a business model would be for this kind of locative audio platform. We have been making a business around it for almost a year. Flexible enough for people to create sound walk, audio tools and sound experience. Which in the future would be toward a general interactive media like VR and 3D kind of things. We start small and validate our business and stay small but I see a

bright future for Echoes.

Sonicmaps, was how we began with in the first place. You can assign sounds to zones that you can define to build a locative audio.

Sonicmaps is just a mobile application and their no editor for it. Like you can not login and upload a sound. So, you have to upload that sound to somewhere like dropbox and copy the link or write that URL somewhere and walk through the city and once you are there you open the application type in the URL manually for that sound. We thought that is ridiculous. Nobody is ever going to use that tool, as there is too much time involved. But, this is what it lead us to echoes.

More recently, I have been thinking of defining a research project, that what is the best way to design for user to experience content. I am frustrated with Echoes as simply an audio platform. As there is so many possibilities to add. I want to solve a bigger research problem. What is the experience that user wants? instead of a business solution to a rush product. You interacting with the environment and the environment interacting with you.

2. INTERVIEW WITH ASMUND SOLLIHOGDA:

Podwalk: During the creation of RECHO, we meet a lot of interesting partners and we a lot of questions regarding, how we control this experience, so we are in charge of what the user is experiencing from the beginning to the end? Also, how do we tell linear stories, and how do we communicate that to inform user the content is available? So while I see RECHO is more as an art installation, PODWALK is a traditional podcast player merged together with audio gathering system. Both application have very different approaches to design thinking. While RECHO is from top to down approach, where I envision the experience would be as amazing, interesting and fantastic as possible. While with PODWALK all the design choices are about making a simple, and intuitive approach. Not focusing on the visual impact's but the content as the focus or the center.

RECHO is interesting because it is made very much without taking anything for granted. While PODWALK is made by taking as much as generic UI and UX in use as possible and experience we gained by looking over the shoulder of the senior members of the community.

Functionality: It has two main tab, features and nearby. Features, has the main banner which at the moment we manually curate but, in the future it will be logarithmically automated. Currently we

do everything as manual as possible and try to keep the a closed ecosystem. We only existed for three months.

Content Creation: We are picking content that has been already made. For example we have been promised by Guardian to receive 30 to 40 sounds from their database. In general in order to collect our contents we approach the CEO's and in cases a museums would like to do a guide. We provide them with several options to create their content. 1. We connect them with external producers, 2. They can produce it in house, 3. They can send a text and we can produce it for them. But the best choice for them is to work with great freelance producers. As we are mainly a software as a service a platform company, rather than content producer. Detour, which is another location aware audio tours application and shares the similar approach as their core experience. Has a totally different business model where they produce the content mostly in house and sell it within the application. We have the opposite mode where the museum is buying the service as if they were buying an alarm system, or smoke detection as part of their infrastructure and this the technology which we sell and they produce the content and put it in. Then it's us who maintains and support their content and also the communication. So we are mainly

a technology driven company. A two man power company, me and Simon.

Technology: For our out door service we use the mobile GPS coordinates and as for indoor beacon technology. The application can also show you pictures, meaning that a picture of top view of a building or picture of an artwork or an artifact. Instead of using proximity signal we use pre-set room sizes beacon signal and the audio/voice will tell you to what to look at, which this helps us to enable our linear storytelling approach. So, as user centric method we just ask the user to follow the audio, a linear story. While we take care of all the technology base matters. This is not a secret project, but at the moment we haven't made much of noise with the social media to promote our service. But, on the other hand we have made customized presentation (mockups) for more than 400 different museum located in Sweden, Norway and Denmark. Not to mention, soon we will start communicating with Finnish museums as well. So far we have 25 interested institutions and 35 which are some what interest within only one month (January) time period. I have to emphasize that our goal is not to only make a museum application, we want to build a site specific storytelling application. Maybe we can call it a disruption for museum industry. Where we can force the museum to acknowledge that their is now a possibility to not make exhibitions behind closed doors. But rather

to make history, storytelling art point of view of their core offering.

Special interest category:

Museums have not caught up with the user experience as they don't really follow up with their users. What user needs for consumption as an experience is lacking. For example they don't have exciting exhibitions and the premises are becoming very boring a dusty place. Not to forget there are of course museum that have great number of visitors.

Creating vitamin and avoiding

painkiller: In this analogy the museum is using painkiller as they either buy a hardware like traditional walkman era or they create their own application, which they should pay around 50 to 60 thousand euros. For a museum that is super expensive and in terms of distribution, marketing, user testing and even maintaining their platform will not be feasible. What we create and offer is, what I call it the vitamin. Firstly our price is one in 100 of the mentioned price.

The platform is user facing and not client facing. We have not built a SDK (Software Development Kit), and did not want to create a system which the user create the content and automatically uploads it online. Instead we do it manually in order to be in contact with the client, so we do it for them. It will take 10 minutes, but it is worth it and would have a higher impact for the user. We

are aware there might be issues when we grow-up and rise to more than 200 clients. Which by hiring a person to be our key account manager and maintain the system would be easily taken care of.

Storytelling: We call it podwalk which is based on podcast. We strongly believe podcasting, as the radio format of the future. We can see the listener based on podcast has grown 20 percent year over year during the past 5 years. Also 17 percent of US citizens listen to podcast every month. Which is still a high percentage in a country with 318 million population. So, I think this format takes over on demand as how today we have changed the format of watching TV. People tend to be less and less on TV, instead seeing it as an authentic experience or use it in special occasions like the Super Bowl, Oscar's or music awards which are live. The whole project took part in 6 months of time from ideation to implementation. Currently, most of our time is spent for marketing.

RECHO: When you enter their webpage after an appealing UI design for their application, Recho. There is a different section Leave your echo - lets you record sounds and tie them to the place they were recorded. Everyone who has the application can find your sounds - when they are listening in the right place." Start exploring - You can listen to Rechoes worldwide. Put on your headphones and stumble upon secrets, music, guides,

fireworks, poetry and more. From spontaneous to carefully planned - The platform hosts content created by users like yourself and professional content creators offering anything from challenging treasure hunts to captivating short stories. Not just for anybody - Surprise the people who matter to you with a personal recho. They get notified when you send them a sound - but they still have to go out and find it!

For recho I was lacking a lot of knowledge, it was published in November 2014. I won a competition for the concept and after the investment it was an easy process. I hired developers and I made the design myself. During that period of time, I was totally in a product mode, without paying attention to the whole system. Questions without answers when I made it, questions like - how to get people on it? what is the experience? what will people record? Because of that our main challenge with recho was to describe to people what to use it for, and what to record.

When building Recho, while talking with my advisor we figured out. The best way to find out what to record and what to use it for was to try it out. Which today I would understand that was a wrong approach. The right approach would be a very much analytical design driven approach. What will be the user scenario and talk to people to see and imagine with them what will such application be doing. The main difficulty with Recho is that it is a time

based media and it is not visual as it is audio time based media. So I think everybody wants to produce something which could be defined as final product.

For example, If you are doing a Medium post. You create a new article, you write your introduction (beginning), body, and finally the conclusion. Also, If you look at twitter, tweet's have certain rules to it. Even Instagram as a product, it has caption, it has a format and it works this way that we experience it today. But, with Recho we were never able to capture a closed entity.

During our design process, we even tried making templates. Asking our user tester's to tell us who they are, what they want to do, where they want to go next in such order.

Instead it is better to give really specific task. In addition I think of what is a facebook post? What is a tweet? twitter was designed for people to tweet. But, today we have become a consume of this product, of tweets. So i think with audio, as it is a multimedia experience in the sense that you are at the place. Like a theater. The place becomes the stage. The audio becomes the actor and wind or any other sound layers become elements of that scene. Thus, we have made a tool for a specific target group. Leah Barclay <http://leahbarclay.com/> is one example of how Recho has been used as a tool to produce the final product in its best.

Mobile Soundwalk: In order to expect users to produce really good content, the platform needs to facilitate them with an extensive

set of tools for editing. Also you still need to provide users with good reward for producing content as listening to it as well.

For example podcast helps you to learn and get entertained or with music you set your mode or enable a environment for concentration. So called a matrix is needed.

Therefore, media consumption should have different benefits and affordances as their core functionalities, whereas it is hard to install core functionalities on soundwalk.

Without any act it is not interesting and I would not spend time doing it. Even though I consider myself in the "super" target group, but I will not be using it.

I feel very confident about Podwalk. I get really excited about it every day as their is many opportunities. The main reason that makes Podwalk interesting is by taking a specialist out and telling stories for the user in order to provide them with in depth understanding. Taking a linear recording, and enabling user to fully engage with their surrounding to create a unique and reproducible experience. Taking an existing infrastructure of a product and making it work as whole. Podwalk is enabling to break down the stiff and professional experiences of museum.

But still there are issue to be considered and be solved. I would say the main problem is to convert from using it to consume it! Transforming technology into an activity.

Give the user the experience that doesn't have technology as it is core experience. Rather use the content!

APPENDIX III. WORKSHOP

1. IDEASPECTOR

<p>IDEA BADMINTON</p> <ul style="list-style-type: none">• This is a method for two persons.• Start carefully forming the questions for ideation.• One starts and the other builds upon that. This way you can combine two treasure chests since we all have a huge amount.• Have fun, defer judgments, number and write down all the ideas.		<p>BRAINSTORM</p> <ul style="list-style-type: none">• Form your task or question well• Go for quantity, 80 - 100 ideas could be created in 45min.• Defer judgments, welcome wild ideas, combine and build on others ideas.• Numbering, writing and drawing ideas visible for everybody make it faster and easier to keep track of what is done.• Ensure that all can contribute.	
<p>SHOW A NEW WAY OF USE</p> <p>What alternative uses could you imagine related to your task? e.g. can you use your laptop as a tray? Tilting it 90 degrees makes it look like a book? Could it be used for weight lifting? Butt warmer? Ice scraper? Frisbee? Sofa table? Shovel? Maybe none of these. But after 15 years I still remember one girl using school book paper for making a rollie cigarette.</p>		<p>FANTASY WORLD</p> <p>Can you find interesting possible touch points in the assignment that could be related to science fiction, fairy tales or some yet unseen fantasy world? Could you replace humans with animals in the communication - how would they act in the situation? Could things maybe become alive? Dogs talk? Could gravity disappear? Or could you change things just by imaging them to?</p>	
<p>ODD PAIR</p> <p>Think what you are now working with and what would be the most surprising and fruitful pair for it? What would have the biggest contrast? Catch attention by creating surprise and meaningful combination of two things. Odd pairs can be made by putting the right thing in a wrong place or combining the right thing with a wrong thing; right thing wearing wrong clothes and so on.</p>		<p>PREPARE A SURPRISE</p> <p>Think of what is predicted? What would be the opposite? What if something would look like something else rather than what it really is? Surprising the system makes us more alert and makes us remember things better. It can be applied to any application with imagination. I received my first Apple laptop wrapped in a local market plastic bag. I could not have been more surprised.</p>	
<p>PLAY WITH TIME</p> <p>Could you use some historical eras or travel into the future in your creative work? Could you combine current era elements with, for instance ancient Greek characters? Or twist your idea with a fifties vibe and attache some old fashioned customer service ideology to it on the meta level? Use stop motion, fast forward things or make them slow motion?</p>		<p>WHAT WOULD X DO?</p> <p>Step into somebody else's pants for a moment: how would a five year old, a rock star or cartoon character solve the dilemma? Or what kind of approach would your favorite designer take? You can also think that you are preparing the idea for somebody inspiring for you. A helpful method especially for motivating and challenging yourself.</p>	

CHANGE PERSPECTIVE

How does the thing look from a bird's eye view, an airplane or from outer space? How about if you observe it close up, through a powerful microscope or through the eye of a frog? New meanings can also be found from curious observation from the new perspectives. A vein of a leaf can turn into a roadmap or a close up of a cheap glass pearls can form up an unreal futuristic scenery.

CHANGE PERSPECTIVE



SOLUTIONS INSPIRED BY NATURE

Observe nature: what kind of different ways flower attract pollinators? Think how flowers and plants spread their seeds through wind, by birds, or other animals eating their fruits? Note: plants precise timing and how they adapt to the environment, wind and sun direction. The true treasure chest is open for you to find totally new approaches.

SOLUTIONS INSPIRED BY NATURE



MAKE A PUZZLE

What would be only the hints and clues of what you want to say? How could you use them to create a delicious riddle for the viewer? Use your imagination to make somebody use theirs. Let the viewer have the joy of solving the riddle. Pave the way for the audience to create their own story around the puzzle. Make the viewer connect with the subject with their own imagination and experiences.

MAKE A PUZZLE



PLAY WITH IT

Think of ways how you could play with things related to the topic that you are working on? How could you make some ideas out of that? We are told not to play with food when we are kids, but in creative work play is absolutely indispensable. Playing makes work more fun and surprising new inventions can be found through playing and acting out.

PLAY WITH IT



TICKLE SENSES

Have you seen a picture that make you drool? This is exactly what this method is about. Just to remind you, the traditional senses are 1) sight, 2) hearing, 3) taste, 4) smell, 5) touch. Other senses are for instance 1) balance, and acceleration 2) temperature, 3) Kinesthetic sense, 4) pain and 5) time. Find out the senses that need to be tickled and then ways to tickle them with!

TICKLE SENSES



CRYSTALLIZE

Think of what is the most essential thing in your brief to deliver? what are the things that differentiate this product from all similar ones, and which of those are valuable for the user? Then play with the diamond that you have condensed and make it shine with brilliant design. Strip away all unrelated features. A good idea combined with design excellence is like a punch in the face.

CRYSTALLIZE



FIND A METAPHOR

Does it look like something else? It is as crystal clear as something else? Are some of the key attributes similar to something else? Is it as fast as bullet? Is it as sweet as something else? Is it wild like a tiger? Could the process be similar to some other process? Gather as many suitable metaphors as you can, and then choose the best metaphors suitable for your use.

FIND A METAPHOR



MAKE A MAJOR ALARM

Think what would make you read the message in general, for a good start? What would force you or somebody else to act immediately? What things would build motivation to do something about it or act in the desired way? Health? Environment issues? 9.99 only today! this is what alarm is all about at its worst. Use your imagination to use this method in a more tempting way.

MAKE A MAJOR ALARM



MAKE IT SEDUCTIVE

What are the most mesmerising elements of the product that you are working with? How could you astonish the audience with these attributes? Think of ways to show the pleasure of owning or using the thing? Could you use sensuous and intensive close-up picture for it? Or focus on the gracious parts of the product?

MAKE IT SEDUCTIVE




2. CITYCALLING (PERSONA, STORYBOARD & ANALYSIS & CRITICAL THINKING)

PERSONA
I want to know the people I'm working with / by visualising their key characteristics

PERSONA NAME: Lotta			
WHO AM I? 60-65 years old -soon to retire -nurse -mexican husband -crafts hobbies	3 REASON FOR ME TO ENGAGE WITH YOU -knows many stories from different people -has time -connect with friends/family	3 REASON FOR ME NOT TO ENGAGE WITH YOU -slowly losing her hearing -not a smartphone user (Nokia) -used to personal contact	
MY INTERESTS - culture, theatre -read newspapers -hockey (former hockey player) -karaoke	MY PERSONALITY -energetic -empathetic -emotional -curious	MY SKILLS -multitasking -good hand skills -mediator -problem-solver -phisically strong	MY DREAMS -travel -interesting experiences -vacation to the Italian alps

STORYBOARD
I want to collect input from others through these activities and touchpoints / to ensure my work is relevant to the people I'm working for

PROFILE Add a drawing that represents the person Name, Age, Gender, Job, living context 	CONNECTIONS AND RELATIONS Who is this person connected to? How? 2 kids. 3 grandchildren 1 husband. 10 Fish.	OBJECTS AND PLACES What physical and digital objects is this person connected to? How, where and when? -her house -1 family laptop -Hakaniemi market -a favorite cafe	MEMORABLE QUOTES, NOTES ON THINGS THAT STOOD OUT
PERCEPTIONS What does this person think or believe about themselves and the world around them? She is happy and satisfied with her life, but she would like to travel more	ASPIRATIONS How does this person think about their involvement in change? What shapes this? -personal engagement rather than world change		


ANALYSIS & CRITICAL THINKING			
I want to develop a clear plan / by evaluating how I am doing and what my options are			
STRENGTHS What do you do better than anyone else? What makes you unique? What unique or lowest-cost resources can you draw upon that others can't? What do people in your market see as your strengths? <ul style="list-style-type: none"> - surprising, it's how - no interface does that off - easy for lotta - no extra hardware, just phone - warm, more personal narration... than headphones... - I don't need to 	WEAKNESSES What could you improve? What should you avoid? What are things that users might see as weaknesses? <ul style="list-style-type: none"> - call at random moment... - quality of sound... might be not enough for engagement - pre-recorded feel, not special like customer cars... - noises, not music... 	OPPORTUNITIES Do people have a need? Do people prefer something else? Are there any changes in technology? <ul style="list-style-type: none"> - Lotta can be a narrator - User engagement 	THREATS What challenges do you face? What are your competitors doing? Is changing technology making things difficult? <ul style="list-style-type: none"> - you want to talk to ppl, not machine - Can't use when travelling
SOLUTION CRITIQUE Review the analysis and come up with at least one reason why the solution will fail.		FINAL CONCEPT Review the analysis and come up with an idea that addresses the issues and makes the concept better. <ul style="list-style-type: none"> - ambient sounds prerecorded by professionals - by default the purpose is not to talk to people 	

3. ONCE... (PERSONA, STORYBOARD & ANALYSIS & CRITICAL THINKING)

PERSONA			
I want to know the people I'm working with / by visualising their key characteristics			
PERSONA NAME: PEKKA			
WHO AM I? A FINNISH GUY. MID-30S. FROM LAHTI. LIVING IN KALLIO. ABOUT TO MOVE OUT. HE'S MARRIED. HE HAS A CHILD AND A DAUGHTER. HE IS A STORE MANAGER.		3 REASON FOR ME TO ENGAGE WITH YOU IT'S NOT ONLY ABOUT SOUND, IT'S SOMETHING MORE. CREATE FAMILY MEMORIES. HE WANTS TO ENTERTAIN PEOPLE.	
3 REASON FOR ME NOT TO ENGAGE WITH YOU HE KNOWS NOTHING ABOUT SOUND + NOT INTERESTED			
MY INTERESTS HE'S INTO SPORTS. ICE HOCKEY. AS A CHILD HE LOVED SPACE. HE IS A	MY PERSONALITY HE'S NOT VERY SOCIAL. WHEN HE GETS TO TALK, HE'S VERY FUNNY.	MY SKILLS HE'S A GREAT DAD. HE'S AN AVERAGE ICE HOCKEY PLAYER.	MY DREAMS HE WANTS AN AFFAIR. HE WANTS MORE MONEY.

STORYBOARD

I want to collect input from others through these activities and touchpoints / to ensure my work is relevant to the people I'm working for

<p>PROFILE Add a drawing that represents the person. Name, Age, Gender, Job, living context</p> 	<p>CONNECTIONS AND RELATIONS Who is this person connected to? How?</p> <p>WIFE + CHILD + DAUGHTER</p> <p>HAS AN OLD AVUNT</p> <p>BEST FRIENDS FROM SCHOOL: MATTI + MIKKO</p> <p>CO-WORKERS, HE LIKES TELLING THEM JOKES</p>	<p>OBJECTS AND PLACES What physical and digital objects is this person connected to? How, where and when?</p> <p>HE HAS A MAC AND AN IPHONE.</p> <p>HIS BEST HOCKEY STICK.</p> <p>HIS PASSWORD PROTECTED JOKE LIST.</p>	<p>MEMORABLE QUOTES, NOTES ON THINGS THAT STOOD OUT</p> <p>"ONCE I MADE A GIRL LAUGH. SHE BECAME MY WIFE".</p>
	<p>PERCEPTIONS What does this person think or believe about themselves and the world around them?</p> <p>HE SEES HIMSELF AS A THIRSTER, BUT HE DOESN'T ADMIT IT.</p> <p>HIS CHILDREN ARE REALLY IMPORTANT.</p> <p>BROUGHT UP AS A NATIONALIST, BUT FIGHTING TO BE OPEN MINDED.</p>	<p>ASPIRATIONS How does this person think about their involvement in change? What shapes this?</p> <p>HE'S NOT SO INVOLVED BUT HE TRIES TO MAKE THE RIGHT CHOICES.</p>	

ANALYSIS & CRITICAL THINKING

I want to develop a clear plan / by evaluating how I am doing and what my options are



<p>STRENGTHS What do you do better than anyone else? What makes you unique? What unique or lowest-cost resources can you draw upon that others can't? What do people in your market see as your strengths?</p> <p>- build collaborative stories</p> <p>- following stories on a route makes it more interesting</p> <p>- good for shy people</p>	<p>WEAKNESSES What could you improve? What should you avoid? What are things that users might see as weaknesses?</p> <p>- not that different from existing apps</p> <p>- not social connecting people</p> <p>- not really social, not connecting people</p>	<p>OPPORTUNITIES Do people have a need? Do people prefer something else? Are there any changes in technology?</p> <p>- entertainment</p> <p>- involve kids</p> <p>- can become a game</p> <p>- puzzling stories</p>	<p>THREATS What challenges do you face? What are your competitors doing? Is changing technology making things difficult?</p> <p>- time-consuming</p> <p>- it can become too mixed up and hard to find pieces that one wants</p>
<p>SOLUTION CRITIQUE Review the analysis and come up with at least one reason why the solution will fail.</p> <p>- not interesting enough stories (hard to maintain quality)</p> <p>- requires too much dedication</p> <p>- hard to keep balance between story creators and consumers</p>	<p>FINAL CONCEPT Review the analysis and come up with an idea that addresses the issues and makes the concept better.</p> <p>- thoughts to keep balance and high quality</p> <p>- tagging system to help findability of stories and routes</p> <p>- purchasing stories</p> <p>- rating system for users and stories</p> <p>- authors</p>		

4. SOUNDTRACE (PERSONA, STORYBOARD & ANALYSIS & CRITICAL THINKING)

PERSONA
 I want to know the people I'm working with / by visualising their key characteristics

PERSONA NAME: <i>Matti Salonen</i>			
WHO AM I? <i>27-30 years old Not a Mlabber Enggineer - Geek Finnish</i>	3 REASON FOR ME TO ENGAGE WITH YOU <i>Diverse variety of sandwiches Immersive experience Story telling</i>	3 REASON FOR ME NOT TO ENGAGE WITH YOU <i>What's happening right next to you. Pattern breakers Soundscape as self explanatory.</i>	
MY INTERESTS <i>Music Computers - tech GPC games Travelling Graphic novels</i>	MY PERSONALITY <i>Geeky Introvert Huge world inside</i>	MY SKILLS <i>Listening / Sound Observant Programming Analytical thinking</i>	MY DREAMS <i>Being in strange / unknown locations Working at CERN Get in a relationship</i>

STORYBOARD
 I want to collect input from others through these activities and touchpoints / to ensure my work is relevant to the people I'm working for

PROFILE What a drawing that represents the person Name, Age, Gender, Job, living context 	CONNECTIONS AND RELATIONS Who is this person connected to? How? <i>Other engineer co-workers BITHub Community</i>	OBJECTS AND PLACES What physical or digital objects is this person connected to? How, where and when? 	MEMORABLE QUOTES, NOTES ON THINGS THAT STOOD OUT
	PERCEPTIONS What does this person think or believe about themselves and the world around them? <i>he's an idealist, going strong towards goals, a bit naive. HE CAN CHANGE THE WORLD</i>	ASPIRATIONS How does this person think about their involvement in change? What shapes this? <i>more humanity FORWARD</i>	

ANALYSIS & CRITICAL THINKING

I want to develop a clear plan / by evaluating how I am doing and what my options are

STRENGTHS What do you do better than anyone else? What makes you unique? What unique or lowest-cost resources can you draw upon that others can't? What do people in your market see as your strengths? - COLLABORATIVE STORYTELLING BASED ON SOUND - OPEN ENDEDNESS - IMMERSIVENESS	WEAKNESSES What could you improve? What should you avoid? What are things that users might see as weaknesses? - IS THE GENERATIVE PART REALLY NEEDED? - KEEP THE SYSTEM AS SIMPLE AS POSSIBLE FOCUSING ON STRENGTHS	OPPORTUNITIES Do people have a need? Do people prefer something else? Are there any changes in technology? - GETTING PEOPLE INTERESTED IN SOUNDS - EXPERIENCE SOMETHING DIFFERENT	THREATS What challenges do you face? What are your competitors doing? Is changing technology making things difficult? - NOT ENOUGH USER BASE. HOW TO GET INITIAL CONTENT.
SOLUTION CRITIQUE Review the analysis and come up with at least one reason why the solution will fail. THE GENERATIVE AND COLLABORATIVE MIGHT BECOME IN CONFLICT.		FINAL CONCEPT Review the analysis and come up with an idea that addresses the issues and makes the concept better.	

5. WORKSHOP IN PICTURES



Participants while illustrating their favorite fictional hero.



While groups are busy generating ideas.



During the ideation phase of this workshop, it was important to presenting idea cards once the speed was going down.

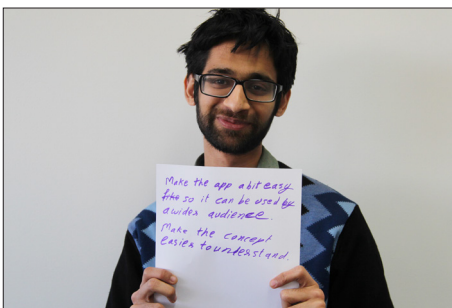
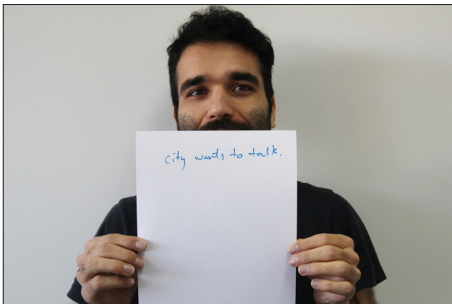
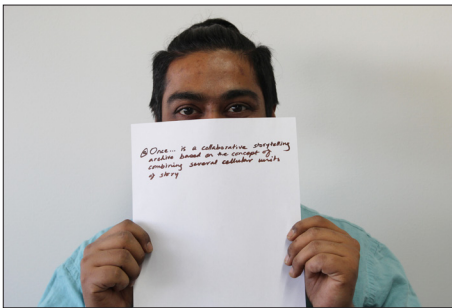
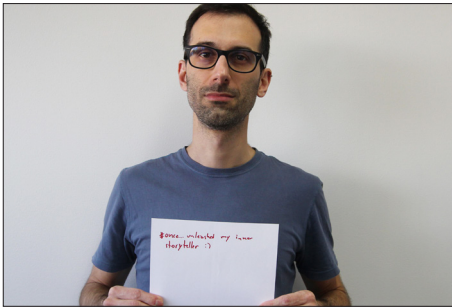


During the Analysis & Critical Thinking, in order to better deliver their feedbacks, two groups are having a discussion.



A group during while making critiques during the Analysis & Critical Thinking.

6. CONCEPT THREADS



During the final presentations, each individual was asked to describe the concept they were building in a catchy and short statement. Some others did not want to have their picture taken.

*"Human beings are members of a whole,
In creation of one essence and soul.
If one member is afflicted with pain,
Other members uneasy will remain.
If you've no sympathy for human pain,
The name of human you cannot retain."*

~ Saadi, Poet

Master of Arts thesis
New Media Design & Production in New Media
Media Lab (Helsinki), Department of Media,
School of Arts, Design & Architecture,
Aalto University, FINLAND



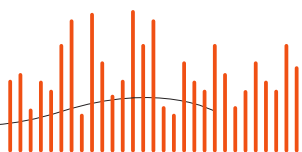
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DESIGN
PRINCIPLES
for
MOBILE
SOUNDWALK
APPLICATIONS

